III

1959-52 **File No.** 8340/36

A CLASS P.W **DEPARTMENT**

N. **BRANCH**

Subject:— Hydro-Electric Project Kalinadi.

A [illegible]

IV

File No. 8340/26 - III

Ftd. Secst. Slip. 94 A

~~5~~ 4 ~~8~~ 9 — 8340/36 | 62847

K.Br. — P.W.D.

Submitted.

2/- File No. 8340/36, containing Q.L.No. 8340/36/55957K, dated the 18-6-52, is put up with File No. LAQ 652 QKA which is sent to P.A. to Minister on the 11-7-52, for use of Minister at the time of replying the L.A. Question. Necy. action on ~~the~~ this case may therefore be held up till return of File No 8340/36 from P.A. to Minister.

~~A.A.S.~~ 12-7-52

A.A.S.

12/7/52

Await (1-8-52)

12/7

8Xed/36/62847

2-1886

KPW.

Pwd

Resubmitted

2/- Main paper [File No 8Xed/36 Part III] have since become available and are arranged within. Please see the letter from the C.E, B.E.G. on p. 175 ante. For reasons stated therein the C.E. B.E.G. has asked the Divisional Forest Officer North Kanara, Dharwar to continue river gauging observations in con. with the Kalinadi Hydro. Electric Project during the current monsoon also. The cost of the work is estimated to be Rs 700/- p. 187 The C.E. forpses that the expenditure in this case shd. be met from the Budget provision of

of Rs. 3,000/- under the head "81-A- Capital Outlay on Ely. Schemes - Preliminary Investigation for the Electric Grid Schemes."

In view of the position explained at 'A' on p. 175 ante, the C.E's proposal may be approved after U.O.R. to the F.D

[Through F.Br. BR/H DEC'62]

F.Br.

Separately in file No. H&F.D. 3872/28334 66768, the H&F.D. has proposed to accord sanction to the appointment of a temp. clerk in connection with the gauge readings at Grand Causeway on Kaveri River on behalf of this Deptt at the instance of the C.E., B.E.G. There seems to be some misunderstanding in the matter. As this Deptt. is concerned with the Kalinadi Hydro El. Project, it is for this Deptt. to accord sanction to the appointment of a temp. clerk. The papers are being rejd. u.o. to the C.E., B.E.G., in connection with the practice in vogue reg: making payment to the temp. clerk, as it is stated that the expdre which is initially debited to H. & F.D. is later recovered from the P.W.D. However, there seem

Case No 11 [illegible]

~~4 of~~ 4

to be no objection to approve the estimate in the meantime. The A.&F.D. may also see U.O.

26/7/52.

B.Bs

The C.E., B'hay Cl. grid's proposal to meet the cost from the provision of Rs. 3,000/- in the current year's budget estimates for preliminary investigations of grid schemes under "81-A." (may) be agreed to. There is no provision for the Kalinadi Hydro Electric Project in the current year's budget estimates.

D.S.(P.W.E)

D.S.

KM
31/7/52

31/7

1/8

B. branch to speak.

2/8/52

6.8.52

Spoken

with U.O. to A&FD. dt. 7

FD.

X with Report on Kalinadi Project

AGRICULTURE & FORESTS DEPARTMENT File No. PWD 8340/36 III Date 7-8-52 Serial No. 6332

P.W.D.

KBm

These papers were informally sent for and brought back from the A&FD on 20-8-52 in connection with file No. L.A.Q. 85-2/52 KA (Qu. No 396 by Shri B.P. Kadam). The reply to the L.A.Q. has been issued and that file has been received back on 4-9-52. These papers may now be sent back U.O. to the A & FD with ref. to proposal and U.O.

AGRICULTURE & FORESTS DEPARTMENT File No. PWD 8340/36 III Date 9-9-52 Serial No. 7262

AS (III)

8/9/52

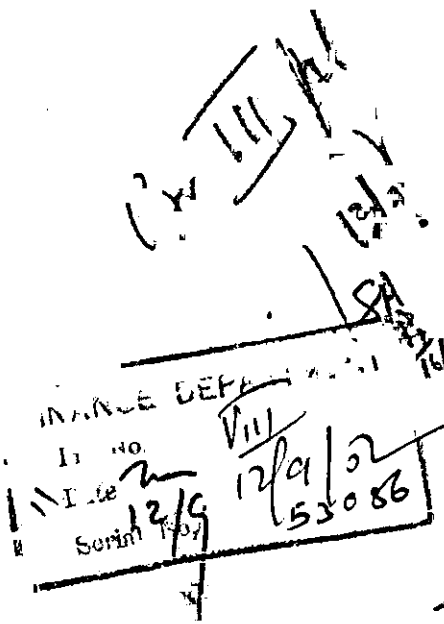
9-9-52

5 5 A1

p. 3-4/n Submitted with ref. to p.no. noti
& 26-7-52.

As far as the main proposal in this p.no. is concerned this Deptt. has no remarks to offer. As regards this Deptt's p.no. No. 3832/66768 reg. entrustment of a post of a temp. clerk for gauge readings at Grand Causeway on Kaveri River on behalf of the P.W.D., that Deptt. has forwarded those p.no. to C.E., B.E.G. for certain clarifications. That Deptt. may be requested to return this D.O. p.no. when done with.

This may be seen and passed on to



Asst.
10/9/52.

A.S. (Shri S) 11/9/52.

x with this Report ✓

x Encl. to D.O. of 11th Sept., 1952

Finance Dept. III.

The proposal made by the P.W.D. in [illegible] p. 186-188 ante.
[illegible] dt. 6-8-52 may be agreed to.
2. The expenditure of Rs. 700 involved on the proposal is being met from the sanctioned grants under "81-A"

7/9/52
[illegible]
18/9/52
9D
18/9
19

D'Eely
19/9

Hy. Br. VIII & V.

U.S. (Br. V)

9D 23/9

2 [illegible] to P.W.D. dt. 20-9-52, [illegible] with report.

P. W. D.
File No. 8340/36
Serial No. 89316

Send Now
23/9 23-K 9-52

7

8340/26
89316

Rwb

KBr
Submitted with letter to the w... to
the AB/RD. & the Fm... of the 7-8-52
P-5 P-6
2. The AB/RD & the F.S. have agreed
to the proposal made by this dept
P-185-15
the draft put up for approval w
issue.
there FBr & BBr

Mk 23.10.52
Mk 13/10/52

KR
11/10/52

Rs 600
inclos

RS (AE)

RR
24/X/52

Kalinadi Hydro-Electric Project.
Preliminary investigations —.

GOVERNMENT OF BOMBAY.

PUBLIC WORKS DEPARTMENT.

Resolution No. 8340/36.

Bombay Castle, 18th August 1948.

Read Government Resolution, Public Works Department, No. 8340/36, dated the 28th October 1947.

Letter from the Electrical Commissioner with the Government of Bombay, No. Elg. 12-A/8223, dated the 14th May 1948, as follows :—

" Reference : Government Resolution, Public Works Department, No. 8340/36, dated 28th October 1947.

" In connection with water flow measurements of the Kalinadi river, a permanent water level gauge has been fixed at Dandeli near the Forest Club Bungalow on the left bank of the river for recording water levels. But in order to give these measurements a quantitative value and establish a stage discharge curve, water flow measurements have to be taken on this river by means of a current meter at various levels during the monsoon.

" 2. For this purpose, it will be necessary to sling a cable across the river, to which a boat can be moored for making the actual measurements. We have not got sufficient time to make these arrangements for measuring velocities during the coming monsoon by this method. However, readings of surface velocities are proposed to be taken by means of floats.

" 3. Similarly the flow of the Kaneri river has also to be measured and for this purpose the foot bridge at Gund Causeway offers a suitable site where a gauge for the measurement of the levels can be erected.

" 4. As it is very desirable to obtain a definite relationship between rainfall and run-off by actual measurements for purposes of detail design, Messrs. Associated Consulting Engineers (India), who are carrying out the work of preliminary survey of the Kalinadi Basin (sanctioned by Government for Rs. 1·65 lakhs under Government Resolution, Public Works Department, No. 8340/36, dated 28th October 1947), have written to me about their willingness to carry out this work for the Electric Grid Department at a cost of Rs. 8,000. Copies* of their letters Nos. ACE/113, dated 21st April 1948 and 27th April 1948, are herewith enclosed for reference. This work is beyond the scope of the investigation work for the Kalinadi Hydro-Electric development being carried out by the firm as referred to above.

" 5. I addressed the following officers on this subject and have obtained their replies telegraphically :—

(i) Superintending Engineer, Southern Circle, Belgaum, expresses his inability to undertake this work due to shortage of staff and time and advises entrusting the work to Messrs. Associated Consulting Engineers (India).

(ii) The Executive Engineer, Kanara Division, Karwar, states that the cost of the work would be Rs. 10,000 for observations on the Kalinadi river and Rs. 8,000 for the Kaneri river but that he would be unable to undertake the work. He has also advised me to entrust the work to Messrs. Associated Consulting Engineers (India).

(iii) The Executive Engineer, Water Research Division, Poona, has also expressed his inability to undertake the work owing to the brief time remaining before the rainy-season and for want of staff and equipment.

(iv) The Divisional Forest Officer, Northern Division, Kanara, Dharwar, who was requested to inform us if his staff would be in a position to record the gauge readings on the Kaneri at Gund Causeway, has replied that they would not be able to do so as the gauge would be situated 3 miles away from Gund.

" 6. As it is necessary that these measurements should be taken during the coming monsoon, I have entrusted this work to Messrs. Associated Consulting Engineers (India), in anticipation of Government sanction to the supplementary estimate which is enclosed herewith and request you to kindly obtain approval of Government for the action taken and for the estimate."

RESOLUTION.—The supplementary estimate amounting to Rs. 8,000 for gauging the Kalinadi river and the observations for stage discharge relations is approved. The Electrical Commissioner should apply for necessary funds under the head " 52-A " in due course.

2. The action of the Electrical Commissioner in entrusting the work in question to Messrs. Associated Consulting Engineers (India) is also approved.

By order of the Governor of Bombay,

A. G. MAYDEO,
Deputy Secretary to Government.

*Printed as an accompaniment to this Resolution.

To

The Finance Department.
The Commissioner, Southern Division.
The Electrical Commissioner with the Government of Bombay (with the estimate).
The Superintending Engineer, Southern Circle.
The Electrical Engineer to Government.
The Accountant General, Bombay (through the Finance Department).

No. of 1948.

Copy forwarded for information and guidance t

Accompaniment to Government Resolution, Public Works Department. No. 8340/36, dated 18th August 1948

ASSOCIATED CONSULTING ENGINEERS (INDIA),
534, Sandhurst Road,
(Near the Bridge),
Bombay 7.

Ref. ACE/113.

21st April 1948.

The Electrical Commissioner with the
Government of Bombay,
Bombay 1.

Dear Sir,

KALINADI HYDRO-ELECTRIC SCHEME RIVER GAUGING.

As you know we have been keeping records of the water level of the Kalinadi for the last twelve months and have now erected a permanent water level gauge at Dandeli.

To give these readings a quantitative value it is necessary to measure the flow of water in the river by current meter at various levels during the monsoon, and by this means establish a stage-discharge curve for the river at Dandeli. It is very desirable to obtain a definite relationship between rainfall and runoff by actual measurements and such a relationship may be regarded as an essential preliminary to detailed design.

The initial reconnaissance of the Kalinadi River from Supa to Vencholi did not disclose a suitable site for a permanent gauging station which would fulfil the requirements necessary to give accurate assessments of river flow at all stages.

The absence of such a site is explained by the character of the river which for the entire length consists of a series of long deep pools separated by very irregular and narrow rock bridges or long rocky chutes broken into many channels. There is thus no "control" section of the river suitable for a guaging station at all stages.

It has, however, been possible to gauge low flows at Supa and Dandeli Causeways and readings were made at these points last summer. For higher flows a reach near the Forest Club Bungalow at Dandeli has been selected.

To measure these high flows, it will be necessary to sling a cable across the river to which a boat can be moored for making the actual measurements. The river is some 300 ft. wide at this point and a heavy cable with substantial anchorages will be required.

We consider that the flow of the River Kaneri should also be measured because it is quite independent of the Kalinadi and it is possible that the construction may be started here first. The footbridge over the river at the Gund Causeway offers a suitable site for measurements at all stages. It is not ideal but it is better than any other point which we have found and it would not require any preparatory work such as the erection of a cable. No water level gauge has been installed here because it is a difficult position in which to place one, but it is hoped that our engineer will be able to make the necessary arrangements when he visits the site in about a month's time to see the completion of the boring work at Supa.

The chief difficulty at Gund is the question of access during the monsoon. It will be necessary to leave a car on the right bank of the Kalinadi at Dandeli for the whole of the flood period, and for the engineer, or engineers, to ferry across the Kalinadi because they will have to stay at the bungalow in Dandeli.

There is not likely to be sufficient time to arrange for readings to be made at Dandeli during the coming monsoon, but we suggest that this should be done at the Kaneri. You may have staff who will be able to undertake this work, but if you wish us to assist you

in the matter, we shall be very pleased to do so. We should point out, however, that the work is beyond the scope of our project report, and should you wish us to undertake it on your behalf, it would be necessary to make a separate agreement with you.

The matter is of some urgency and we should be pleased to come and discuss it with you at your earliest convenience.

Yours faithfully,
for Associated Consulting Engineers (India),

(Signed) J. K. Hunter.

Associated Consulting Engineers (India),
534, Sandhurst Road,
Bombay 7.

Our Ref. ACE/113.

27th April 1948.

The Electrical Commissioner with the
Government of Bombay,
Electric Grid Offices,
Foreshore Road,
Bombay 1.

Dear Sir,

KALINADI HYDRO-ELECTRIC SCHEME RIVER GAUGING.

We thank you for your letter of the 24th April 1948, Reference No. Elg. 12-B/7259, asking us for our terms and the approximate cost of gauging the River Kaneri.

We consider that it will be fairer to both parties if this work is done on a time basis because the cost of the work depends almost entirely on the time when the floods occur. Our remuneration for this work would, therefore, be based on the following scale:—

(*a*) Actual cost of salaries and allowances paid to the technical staff engaged upon the work in India and the United Kingdom.

(*b*) An amount equal to 100 per cent. of (*a*) above to cover clerical staff and the general overhead expenses of the organisation.

(*c*) An amount equal to 25 per cent. of the sum of (*a*) and (*b*) above to cover the services of the Partners and the remuneration of the firm.

(*d*) All out-of-pocket expenses necessarily and actually incurred in connection with the work in respect of:—

(i) Travelling and hotel expenses of staff engaged upon the work.

(ii) Living expenses incurred by the staff outside Bombay.

(iii) Printing and reproduction of documents, drawings and records and the purchase of maps.

(iv) Fees for legal advice taken or sought on behalf of the Client.

As already explained to you in our previous letter, it would be necessary to leave the jeep on the right bank of the river for the whole of the flood period, which will probably be of the order of 4 months. We should, therefore, ask for a payment of Rs. 150 (rupees one hundred and fifty) per month whilst the jeep is retained there. It would be necessary to stay at Dandeli Forest Club Bungalow, and we hope that it will be possible to arrange for all transport on that side of the river to be done by public bus. If this proves impossible we shall have to take another vehicle down there as well as the jeep.

It is highly desirable, in fact almost essential, to employ two engineers on the reading of the current meter, and we would suggest that it would be a useful experience for one of your staff, besides saving cost, if you could second one of your junior engineers to our staff for the period of the work to assist us. It is, of course, impossible to be sure when the floods are going to occur, but we think that it would be necessary for the party to move down to the area about the middle of June and remain there possibly about a month.

The fixing of the water level gauge on the Kaneri at Gund Causeway can be done by our engineer on his next visit to the site, but the river gauging itself will, of course, have to take place during the early floods at the beginning of the monsoon.

You do not mention in your letter the ganging of the River Kalinadi. We agree that it will not be possible to supply and erect the equipment necessary to make velocity recordings with a current meter before this monsoon, but we do think that some useful information could be gained if the surface velocity was measured by floats. This method has been very extensively used throughout India as you will probably know, and it requires

no preparatory work, except the measuring of the cross-section of the river, which we have already done. We would suggest, therefore, that measurements of the velocity of the Kalinadi should be made by this method. As the engineers will be living right on the site of the Kalinadi gauging station it should be possible for them to make the necessary measurements at times when they cannot visit the Kaneri and the length of their stay on the site should be little increased by this valuable additional work.

If you are able to second one of your junior engineers as we have suggested, we think that the total cost of the work, including all travelling and living expenses, is likely to be of the order of Rs. 8,000 (rupees eight thousand).

We shall be pleased to discuss the matter further with you if any points require amplification.

Yours faithfully,
for Associated Consulting Engineers (India),
(Signed) J. K. HUNTER.

ASSOCIATED CONSULTING ENGINEERS(INDIA)

HAROON HOUSE
294, BAZAAR GATE STREET
FORT BOMBA Y.

Our Ref:-ACE/180
21st April, 1949.

Dr. B.K.Ram Prasad,
Superintending Engineer(Hydro).
Electric Grid Offices,
Foreshore Road,
Bombay 1.

Dear Sir,

KALINADI RIVER GAUGING 1949.

We thank you for your letter of the 14th April, Ref. No.H .7-3Ø6130, which we received on the 18th asking us to give you an estimate of the cost of measuring the discharge of the Kalinadi at Dandeli during the 1949 monsoon.

During 1948, discharge measurements were made from boats which were reliable upto a gauge reading of 8 ft. beyond which it was not safe to operate. In our estimate of the 2nd March 1949, we therefore stated that it will be necessary to make the next series of measurements with the assistance of a wire cable slung across the river. This will enable us to get accurate readings of the highe discharges.

The design, acquisition, and erection of the necessary material will not be a simple matter, and it was for this reason that we stated that three months' notice would be necessary before we could commence the measurements.

The monsoon is likely to start in less than two months from now so that time is now very short, and we cannot guarantee that the work can be done this year.

We think, however, that there is still a possibility that we can complete our preparations in time.

We have therefore given full consideration to your requirements, and we specify below what we think is necessary to comply with them.

(a) Water Gauge.

We have no longer time to replace the existing posts by ones that could really be called permanent as these should, we think, be made of concrete, but we propose to erect wooden posts with a concrete foundation and an enamelled metal reading scale.

(b) Suspension Cable.

We would purchase a steel wire rope suspension cable and timber posts for use as towers. This cable would be anchored to concrete blocks sunk in the banks. In addition, we would purchase a smaller steel wire rope traversing cable and also a light suspension cable for the current meter itself. We would endeavour to hire the necessary tackle, pulley blocks, etc., that would be necessary in addition to the above. The steel cables would be left in position at the end of the season and would be your property for

further use there or elsewhere, as you may wish.

(c) Measurements.

We would arrange for two engineers to be present at the site for three months, during which time they would measure the water velocities by current meter at all stages above the flooding the causeway to the maximum flooding level recorded during the season. We would also measure the surface velocity by floats when possible.

(d) Discharge Curve.

The river discharge would be calculated from the velocities recorded and a stage-discharge curve plotted.

Our fees wouldbe calculatedon the basis of engineers' time as set out in our letter of 2nd April 1949, referencenumber ACE/113/190/180 addressed to Mr. Advani, and we attach the details of our estimate assuming that it will be necessary for us to have two engineers on the site. Should you wish to second one of your engineers, as last year, we should only send one of ours. The total cost including supply and erection of the necessary gear is estimated at Rs.30,750/- . Of this figure, the cost of permanent and semi.permanent materials will be Rs.3500/- and the cost of time for designing, procuring material and erection Rs.5000/-

We have gone very carefully into the matter while calculating this estimate, especially as we already have the actual costs of last year's measurements, which was Rs. 18,000/- . Our proposals this year should give you information of a far greater importance than before asit will be possible to take many more measurements, probably with greater accuracy and certainly over the full range of the river flow rather than just the lower stages. The present estimated cost compares closely with the ascertained cost of last season's work, bearing in mind the additional work involved andthe longer gauging period for which we have allowed.

You will remember that in our Report on the Kalinadi Scheme, and in our letter of the 2nd March 1949,Ref. ACE/190, already referred to, we stated that further silt sampling wouldbe required. This could be done most conveniently and cheaply at the same time as the river gauging , and we have estimated that the cost of this additional work would be Rs. 5000/- These estimates provide for all contingencies that may arise in the execution of the works.

We trust that this is the information which you require, and we will do our best to carry out the work during the 1949 monsoon, but we must emphasise that this depends on the receipt of early instructions from you.

Yours faithfully,
For ASSOCIATED CONSULTING ENGINEERS(INDIA),

d/-

(A.C.Fielding.)

Encl:-

SVM/9/5/.

KALINADI HYDRO - ELECTRIC SCHEME.

River Gauging at Dandeli 1949.

Estimate of Cost.

1.	Engineers' time.		
	(a) On the site (including erection of W.L.gauge and meter suspension cable)	Rs.4,900	
	(b) Bombay Office (Including design and arrangements for erecting gear.	Rs.3,000	
	(c) London Office	Rs.1,000	Rs. 8,900
2.	135% of Engineers' time.....		" 12,000
3.	Permanent water level gauge. Supply of material and local labour for construction (charged at cost).		" 350
4.	Suspension cable for current meter Supply. of material and local labour for construction (charged at cost).		" 3,500
5.	Living expenses on site, travelling (including use of Jeep), hire of coolies.		" 5,500
6.	Printing of Report.		" 500
		TOTAL	Rs. 30,750

SILT SAMPLING.

Estimate of Cost.

1.	Engineers' time.		
	(a) On site (included in River gauging,		
	(b) Bombay Office.	Rs. 400	
	(c) London Office.	" 1,000	Rs. 1,400
2.	135% of Engineers' time.	...	Rs. 1,900
3.	Analysis of samples.	...	Rs. 1,400
4.	Printing of Report.	...	Rs. 300
			Rs. 5,000

SVM/9/5/.

Verbligent

LETTER.

No. H7-3/7806
Electric Grid Offices,
Foreshore Road,
Bombay 1: 12th May 1949

To

The Secretary to Government,
Public Works Department,
Bombay.

SUBJECT:- Kalinadi Hydro Electric Scheme.

Messrs. Associated Consulting Engineers (India) were entrusted with the work of river gauging of Kalinadi during the monsoon of 1948 at an estimated cost of Rs 8,000/-/- (sanction:Government P.W.D. Resolution No. 8340/36. dated 18.8.1948).

Due to the vagaries of the monsoon the work took a much longer time than estimated and their estimate for the work done is Rs 18,000/-/- (Messrs. Associated Consulting Engineers (India)'s letter No. ACE/180 dated 21.4.1949).

During the last monsoon, the discharge measurements were made from a boat, which were reliable upto a gauge reading of 8 feet only.

River gauging operations will have to be undertaken again during the coming monsoon at Dandeli to measure discharges during the floods.

The additional work in this connection will involve fixing a steel wire rope suspension cable anchored, to concrete blocks erected in banks and timber posts for use as towers and replacement of the existing gauge posts by wooden posts with a concrete foundation and an enamelled metal reading scale. The water velocities will have to be measured by a current meter suspended from a cable at all stages above the flooding of the causeway to the maximum flooding level. The river discharge would then be calculated and a stage discharge curve will have to be plotted.

Messrs. Associated Consulting Engineers (India) have written to me that they can carry cut this work at an estimated cost of Rs 30,750/-/-. They also undertake to carry out further silt sampling necessary, conveniently and cheaply at the same time at an additional cost of Rs 5,000/-/-,(copies of their letter No. ACE/180 dated

is necessary that the above work be carried out and I recommend it it be entrusted to the Associated Consulting Engrs (India)

I shall be much obliged for very early orders of Government.

Encl: 2 copies of letter.

Yours faithfully,

Electrical Commissioner
with the Government of Bombay

MTB/10.5

El.12/15 Pt. 9/12

8340/36

Ext. of 33139

No. H.7-3/ 962-6
Electric Grid Offices
Fore shore Road.
Bombay 1. 8/11 June 1949.

Electric Grid Offices

Reference Mr. V G. Joshi's enquiry on 31/5/49. The following information about the Engineer's time referred in the estimate of cost enclosed with the Electrical Commissioner's letter No. H.7-3/7806 dated 12/5/49 is supplied.

The amount corresponding to Engineer's time is the actual cost of salaries and allowances to be paid to the technical staff engaged upon the work in India and the United Kingdom.

The amount of 135% of Engineer's time covers the expenses of the clerical staff, the general overhead expenses of the organisation services of partners and the remuneration of the firm.

Please refer accompaniment to Government Resolution P.W.D. No. 8340/36 dated 18th August 1948 lette No. A-CE/113 dated 27/4/48, para 2, (a), (b) and (c) where similar explanation is given to the estimate of Rs. 8000/- for Kalinadi guaging of 1948.

M/s Associated Consulting Engineers(India) have intimated this office (vide their letter No. A.C.E./ dated 30/5/49 - copy enclosed) that the estimate of Rs.30750/- for Kalinadi gauging for 1949, is based or 3 week's time to fix the water level gauge and meter suspension cable and 14 weeks for observations.

The Government will be addressed for sanction additional expenditure incurred by M/s Associated Consulting Engineers(India) for Kalinadi gauging of 1948, separately.

G. Srinivas Bhat. 8/6
Assistant Engineer (Hydro)

Encls:1.M/s A.C.E.(I) letter
referred above.
2.File no.8340/36
P.W.D. El. Branch.

V.J. Joshi, Esqr.,
Deputy Engineer,
P.W.D. Secretariat, Bombay.

DSM/8-6.

ASSOCIATED CONSULTING ENGINEERS(INDIA).

HAROON HOUSE,
294,Bazar Gate Street
Fort,BOMBAY.

OurRef. ACE/180.
30th May,1949.

Dr.B.K.Ram Prasad,
Superintending Engineer(Hydro),
Electric Grid Offices
Foreshore Road,
Bombay No.1.

Dear Sir.

KALINADI- RIVER GAUGING 1949.

We refer to our conversation with you this morning a to the request from your office on the 28th instant for fu particulars of the estimate for the cost of river gauging accompanied our letter of April 21st,1949.

As you know, we should propose to charge for the wor in accordance with the time spent thereon,and with the asc expenses,and the estimate was given for your guidance only do not know that more detailed figures will be of much val but we have attempted on the attached schedule to give mor detail than in our earlier one.We believe that the estimat a whole is a reasonable one;but you will understand that t more detail which is given the more likely is it that the ascertained cost of individual items will differ from the estimated cost.

In the attached schedule he estim between the cost of providing t river g and the cost of making the actu antic that it will take some 3 weeks to fix the water level re and the meter suspension cable,and an allowance of 14 ks site has been made for reading.The staff on site would ke silt samples,if you wish this tobe done,and the remain c the estimated cost of silt samples is made up of the sy interpretation of the results and of their analysis.We nt particularly the amount of 135% added to engineers' ti.Th is to cover office over-head charges etc.and is the ree percentage at which we offered to undertake the invest t of the Supa scheme,if we were asked to do so.

We shall be pleased to know that you wish us to u further river gauging,although it is,of course,too late the work this year.

We hope that the additional information on the att schedule may be of use to you,but please let us know if is anything further that you require.

Yours faithfully,
For ASSOCIATED CONSULTING ENGIN
(INDIA)

Sd/- A.C.Fielding

KALINADI HYDRO ELECTRIC SCHEME.

River Gauging at Dandeli 1949.

Estimate of Cost.

	Provision of gauge etc. (1)	Gauging etc. (2)	Total. (3)
Engineers' time:			
(a) On the site (including erection of W.L. gauge and meter suspension cable)	Rs. 600	Rs. 4,300	Rs. 4,900.
(b) Bombay Office (including design and arrangements for erecting gear)	" 900	" 1,700	Rs. 2,600.
(c) London Office.	" 200	" 200	" 400.
	-	" 1,000	" 1,000.
	Rs. 1,700	Rs. 7,200	Rs. 8,900.
135% of Engineers' time	" 2,300	" 9,700	Rs. 12,000
Provision of permanent water level gauge:			
(a) Material	Rs. 300		
(b) Labour.	Rs. 50		
	Rs. 350		Rs. 350
Provision of suspension cable for current meter:			
(a) 2000 each ½" and ¼" steel cable	Rs. 1,875		
(b) Concrete	" 370		
(c) Steel towers etc.	" 500		
(d) Hire of pulleys	" 100		
(e) Coolies	" 200		
15% transport, contingencies etc.	" 455		
	Rs. 3,500		Rs. 3,500
Living Expenses on site:			
(a) 1 engineer 14 weeks, 1-17 weeks	Rs. 210	Rs. 1,960	Rs
(b) Jeep-1500 miles	" 50	" 450	
(c) 3 journeys from and to Bombay	-	" 450	
(d) driver, cook, coolies etc.	" 300	" 1,490	
(e) Contingencies, say	" 70	" 520	-
	Rs. 630	Rs. 4,870	Rs. 5,500
Printing of Report. ...	-	" 500	" 500
	Rs. 8,480	Rs. 22,270	Rs. 30,750

NGK/7/6

8340/36
32139

El.Br. P.W.D.

In G.R.No.8340/36, dated the 18-8-48, Govt. approved, at an estimated cost of Rs.8000, the work of gauging the Kalinadi river, which work was entrusted to M/S. Associated Consulting Engineers (India). The Elecl. Commr. now reports that the work took a much longer time than estimated due to the vagaries of monsoon and the Consulting Engineers' estimate for the work done is Rs.18,000.

2. The Elecl. Commr. further proposes that -

(a) the additional work of river gauging operations during the coming monsoon at Dandeli to measure discharges during the floods may be entrusted to M/S. Associated Consulting Engineers (India) at an estimated cost of Rs.30,750.

(b). the work of further silt sampling may also be entrusted to the same Engrs. at an additional cost of Rs.5000.

3. If appd., the above proposals of the El. Commr. may be accepted in u.o. consultation with the R.C.D. and F.D.

4. The El. Commr. has not made it clear how the exceeded amount refd. to at 'A' above has been met with. Sanction of Govt. to revised estimate will be necy. This point will be taken up after the orders on para2 above are issued in consultation with the R.C.D. and the F.D.

VSD
25/5/49

Through A.B.(II) & D.E.(I).

ASS
26/5/49.

4. Expr. may be authorised under '52-A'. Necy. source will be pointed out later.

26.5.49.

Resubmitted on 11-6-49.

D.T.
Secy.(W)
U.O.

proposals made by the

8340136
32139

Elec Comm may be accepted in
U.O. Consultation with the R.C.D. and F.D.

RECONSTRUCTION DEPTT
File No. P.W.D. 8340/36/3213
15 JUN 1949
Serial No. A ×××

V. urgent
U.O. to R.C.D. & F.D. dt 13-6-49

R.C.D.

Seen & passed on to

P. W. D.
File No. 8340/36
Serial No. 43254

El. Br. 21/6

FINANCE DEPARTMENT
File No. A
Date 22/6/49
Serial No.

Ref. to F.D. dt. 21-6-49

Addl. Deptt (P.W.D.)

The proposal made by may be agreed to.

The P.W.D. may

N.I.4
28/6/49.

2. The work of the preliminary survey of the Kalimati Hydro-Electric Project was approved by the C.A. in 1947-48. The proposal to undertake detailed survey and exploratory work for the preparation of the project has been accepted in principle by the E.P.C.

3. Attention is invited to G.R., P.W.D. No. 7993/36 dt 9.5.1949 according to which all expenditure including that in the nature of preliminary expenditure is to be debited ab initio to Capital head i.e. "81-A - Capital Outlay, etc". In view of this, para 4 of the foregoing P.W.D. does not appear to be correct. The expdr. will have to be authorised under "81-A".

UHK 29.6.49

Copy to the P.W.D. dt 1.7.49

19

Letter

No. H7-3/11849
Electric Grid Offices,
Foreshore Road,
Bombay 1: 16th July, 1949.
18th

To.

The Secretary to Government,
Public Works Department,
Bombay.

Subject — Kalinadi Hydro-Electric Scheme.

Reference — This office letter No.H.7-3/7806 dated 12th May, 1949.

With reference to the letter submitted to Government in connection with the water-flow measurements and silt sampling at Dandeli, I have to state that as the Monsoon has already set in and Government sanction has not been ~~obtained~~ issued so far, it is not possible to commence the work this year. Therefore, I withdraw my proposal in the above letter and will send fresh proposals for the next Monsoon in due course.

Electrical Commissioner
with the Government of Bombay.

a/16.7.

ASSOCIATED CONSULTING ENGINEERS(INDIA)
534, Sandhurst Road
(Near the Bridge),
Bombay 7, 16-6-1948.

No.ACE/113.

The Bombay Electric Grid,
Foreshore Road,
Bombay.

Dear Sirs,

We have today paid to messrs.Alladin Virjee Nathani the sum of Rs. 4,477/8/- being final payment for boring works in connection with the Kalinadi Hydro-Electric Scheme.

We enclose copy of this account, in duplicate, and should be glad if you would refund the amount to us at your convenience.

Yours faithfully,
for ASSOCIATED CONSULTING ENGINEERS(INDIA).
Sd/- xxxxxx

Encl: (typed below).

ALLADIN VIRJEE NATHANI

Ref.No.786/504.

Darukhana,
Mazagaon, Bombay -10.
9-6-48

The Associated Consulting Engineers(India),
534, Sandhurst Road, (Near the Bridge),
Bombay.

KALINADI HYDROELECTRIC SCHEME

DR.

To Transport boring rigs to and from site.....@ Rs. 3500/- lumpsum	Rs. 3,500-0-0
" Erect and dismantle rigs - 64 bores.....@ Rs. 80/- per bore	Rs. 5,120-0-0
" Transport more than ½ mile - 33½ miles @ Rs. 15/- per mile	Rs. 502-8-0
" Percussion drilling - 1986' ft. Rs. 16/- per ft.	Rs. 31,776-0-0
" Core Boring - 155' ft. @ Rs. 26/- per ft.	Rs. 3,875-0-0
	Rs. 44,773-8-0
Less total amount received	Rs. 40,296-0-0
Balance due being the amount 1f 10% retention	Rs. 4,477-8-0
	E. & O.E.

FOR ALLADIN VIRJEE NATHANI

Sgd. H.G.Chinoy.
MANAGER.

Rupees Four thousand, four hundred, seventyseven and annas eight only.

ARK.22.7.49.

ASSOCIATED CONSULTING ENGINEERS (INDIA)

534, SANDHURST ROAD,
(Near the Bridge)
Bombay 7.

Our Ref: ACE/113.

28th January. 1949.

The Electrical Commissioner
with the Government of Bombay,
Electric Grid Offices, Foreshore Road,
Bombay.

Dear Sir,

KALINADI HYDRO-ELECTRIC SCHEME
REVISION OF ESTIMATE OF FEES.

We refer to your letter of the 27th September 1948 Ref.No.Elg-12-A/15478.

Our answers to the points made in your letter are as follows:-

(i) Interim Report

There is considerable difference between the work entailed in the submission of periodical reports which give an outline of the progress made on the work in general terms and the preparation of an Interim Report which gives the latest technical conclusions at any stage. The preparation of an Interim Report resulted in additional expenses, but we agree that we did not draw your attention to this fact when we suggested that the report should be prepared.

(ii) Increase in catchment area:

The original area of 800 sq.miles was taken from the Bowers' Report and our estimate was made up before any member of the staff had seen the site. Our letter to you dated 16th December, 1946, setting out our terms, laid frequent stress on the need for and our intention of carrying out a comprehensive survey of the whole river basin. Mr. Srimpton did not say that the lower Kalinadi scheme would not be pursued, but that this scheme could not be developed until the regulation had been provided by schemes higher up the river, and it would, therefore, be the last scheme to be developed at any rate on the main river itself.

(iii) Delays in Boring:

We are unable to agree that it is usual for boring work to take nearly four times as long as agreed in the contract, and we consider that we should not suffer on the boring contractor's account.

Additional Hydrological studies.

In our letter of the 16th December 1946, we did state that we would carry out extensive hydrological studies over similar catchments, but had the report been submitted as originally planned, we should not have been able to carry out all the studies which have since been made as a result of the delay in the submission of the mosaic.

Our latest estimate for the total cost of the Project Report gives a figure of Rs 1,68,200/- as against our estimate made in August last year of Rs 1,59,400/- and it is made up as follows:-

Account paid for the work to June 30th 1948	Rs 1,05,253
Account for quarter ending 30th September, 1948 (not yet submitted).	Rs 13,724
Account for quarter ending 31st December, 1948 (not yet submitted and not audited).	Rs 14,710

Remuneration at 25% on Engineers' time and allowances for clerical staff on all the above accounts:	Rs 27,775
	Rs 1,61,462
Estimated cost of remainder of work during January 1949	6,750
Final Total	Rs 1,68,212

You ask in your letter under reply for itemised costs which were included in the lump sum figure of Rs 1,05,000/- and the increase in each of these, as well as the reasons therefor. On the attached sheet we show the costs of technical staff, expenses and additional percentages permissible as used in our original estimate, the actual cost to 31st December 1948, the estimated final cost and the difference between the first and last items. The reasons for these increases have been discussed above and in various earlier letters, and we would draw your attention to the fact that the cost of salaries has actually been twice the estimated amount due to the two seasons working and the increase in salaries over that time. For easy reference the following previous correspondence relates :-

Our letter of the 14th July 1948, Ref.No.ACE/113.
Your letter of the 23rd July 1948, Ref. No.Elg.12-A/12749
Our letter of the 30th August 1948, Ref.No.ACE/113.
Your letter of the 27th September 1948, Ref.No.Elg.12-A/15478.

We give below the costs of all work in connection with the preparation of the Project Report, as estimated in 1946 and the actual figure assuming our estimate for work during January 1949 to be correct:-

	Estimated cost 1946.	Actual cost.
Associated Consulting Engineers (India)	Rs 1,05,000	Rs 1,68,212
Borings and test pits	" 35,000	" 44,773
Aerial survey	" 38,000	" 19,985
	Rs 1,78,000	Rs 2,32,970

We trust that this letter together with previous correspondence referred to gives you all the information that you require for the submission of our revised charges to Government.

Yours faithfully,
For ASSOCIATED CONSULTING ENGINEERS (INDIA)

Sd/-

A.C.Fielding, Chief Engineer.

	Original estimate of cost (based on one season's field wk.	Actual costs to Dec. 31st, 1948,	Estimated costs to completion of wk. i.e. Jan. 1949.	Estimated final cost.	Difference between Estimated final cost and original lump sum estimate.
	Rs	Rs	Rs	Rs	Rs
1. Salaries:					
(a) In India					
(i) Bombay office	9,350	18,834	200	19,034	+ 9,684
(ii) Site	7,300	15,311	-	15,311	+ 8,011
(b) In U.K.	13,350	27, 574	1910	29,484	+ 16,134
ii. Expenses:					
(a) Travelling UK - India	7,400	4,182	-	4,182	- 3,218
(b) Travelling in India & site expenses	4,300	16,302		16,302	+ 12,002
(c) Printing Report, Documents, Maps, Cables, Specialist's advice.	2,000	2,107	2000	4,107	+ 2,107
iii. Contingencies	14,425	-	-		- 14,425
iv. 80% on cost	30,000	49,376	1690	51,066	+ 21,066
v. 25% remuneration	16,875	27,774	950	28,724	+ 11,849
vi. Totals	1,05,000	1,61,460	6750	1,68,210	+ 63,210

S/
25/7

ASSOCIATED CONSULTING ENGINEERS (INDIA)

Haroon House,
294, Bazar Gate Street
Fort, Bombay.
2nd April 1949.

Ref.ACE/113/190/180
CONFIDENTIAL

Dear Mr.Advani,

KALINADI REPORT-FEES:

I enclose a revised schedule showing the proposed total for this work which you will see amounts to Rs.1,45,064. You will find that it has been made up exactly as you suggested and includes the figures which I took down at our last meeting, with the exception that the final cost is based upon a letter from London of March 25th, and amounts to Rs.1,70,951; the difference between this and the former estimated total is taken to be on account of London Office and is, therefore, subject to a reduction of 50% and a further reduction of 12½% on remuneration. I hope that you will find this proposed total acceptable.

SUPA - PROPOSED TERMS :

We have now received from London the details upon which the estimate for this work was based. We are able to reduce the overhead charge on our own staff from 150% to 135% and on your staff seconded to us from 100% to 80%. These reductions are possible only because an appreciable amount of site work is involved and could not, I am afraid, apply to Koyna.

I am anxious that the revised terms should be as attractive as possible; if you would like any modification as between the percentages now proposed for your and for our staff, this would be possible providing, of course, that the over-all result were the same as with the percentages given above. One possible variation might be the payment of a small fixed fee, say Rs.1,000 per month, which would enable the percentage on our own staff to be reduced to 125%.

I should welcome the opportunity of discussing these terms with

This letter gives me an opportunity of mentioning a point which I had intended putting to you at our next meeting. It occurs to me that if you decide to submit our terms for this work to your Government, you may find it a convenience if a small percentage were added to the total estimate of our fees as a provisional sum. The object of this would be to enable you to call upon us from time to time, if it seemed helpful to you, for work outside the present Terms of Reference without the necessity of obtaining further sanction from your Government. Such work might perhaps be associated with transmission, the provision of temporary supplies or other problems relating to the rest of the Kalinadi Scheme. I do not know whether this idea may appeal to you or not.

KALINADI - RIVER DISCHARGE MEASUREMENTS:

I mentioned to you at our last meeting that the original estimate of Rs.8,000 for this work had been greatly exceeded, the final cost amounting to Rs.18,000. The original estimate was based upon one month at site, as mentioned in our letter of April 27th 1948, whereas the actual time, including travelling, was 12 weeks. When submitting our estimate we mentioned that the difficulty of forecasting the progress of the monsoon made it impossible to treat the estimate as a maximum. I trust, therefore, that we are in order in submitting our account officially, and this we propose to do during the next day or two.

Yours sincerely,

Sd/- A.C.Fielding.

P.B.Advani, Esqr.,
Electrical Commissioner with
the Government of Bombay,
Electric Grid Offices,

	Original Estimate (based on one season's field work). (1) Rs.	Final Cost. (2) Rs.	Difference between (1)&(2). (3) Rs.	Proposed difference chargeable. (4) Rs.	Proposed total charges (5)
i. Salaries:					
(a) In India -					
(i) Bombay office:	9,350	19,054	9,694	4,848	14,182
(ii) Site: -...	7,300	15,311	8,011	8,011	15,311
(b) In U.K.	13,350	30,704	17,354	8,677	22,027
	30,000	65,049	35,049	21,536	51,520
ii. Expenses :					
(a) Travelling U.K.-India:	7,400	4,182	- 3,218	3,218	4,182
(b) Travelling in India and site expenses :	4,300	15,302	12,002	12,002	16,302
(c) Printing Report, documents, maps, cables, specialist's advice :	2,000	4,107	2,107	2,107	4,107
iii. Contingencies:	14,425		14,425	-	
iv. Overhead charges :	20,000	52,939			
v. Remuneration	15,875	29,272	13,397	4,848*	
TOTALS ...	1,06,000	1,70,951	65,951	40,064	1,48,964

* Rs. 21,536 chargeable @ 18¾%.
+17224

AMK.5.4.49.

ASSOCIATED CONSULTING ENGINEERS (INDIA)

Our Ref: ACE/180.

31st August 1948.

Dr. B. K. Ram Prasad,
Superintending Engineer (Hydro),
Electric Grid Offices,
Foreshor Road,
Bombay 1.

Dear Sir,

KALINADI HYDRO-ELECTRIC SCHEME
RIVER DISCHARGE.

As referred in your telephone conversation with Mr. Shrimpton this morning, we have made a further estimate of the cost of the measurement of the river discharges in the Kalinadi and Kenari which can be more accurate now that the work is nearly completed.

Our latest estimate for the work is Rs 15,500.

You will remember that we explained that our original estimate of Rs 8,000 was controlled entirely by the behaviour of the river and we had estimated then that the work should be finished in 6 weeks. In actual fact the work has taken 11 weeks largely because the monsoon rains failed in the middle of the period and the rivers went down again when it was hoped that higher readings could be obtained. Also it was not possible to start the work in earnest until towards the end of June, because of the difficulty in extracting the current meter from the Customs Department where it had been lying since March.

Two small items which have increased the cost slightly are the Living Expenses for your Engineer Mr.Rama Rao, which cost Rs 300. We hope that you will eventually be able to obtain a Government Grant for an increase in his allowance, but until that is done it remains a charge on our account. In addition, we found that we required many more coolies for the work than we had anticipated and this amounted to something like Rs 250.

We hope that this estimate will be suitable for your present purposes.

Yours faithfully,
For ASSOCIATED CONSULTING ENGINEERS (INDIA)

Sd/-

Chief Engineer.

ASSOCIATED CONSULTING ENGINEERS(INDIA)

Haroon House,
294, Bazar Gate Street,
Fort, Bombay.
8th June 1949.

BY HAND

No.ACE/180.
The Bombay Electric Grid,
Electric Grid Offices,
Bombay 1.

Dear Sirs,

KALINADI RIVER GAUGING

We acknowledge receipt of your letter No.H-7-3/9375, dated 6th June 1949, and as requested therein, we forward you our fees and expenses for river gauging in the Kalinadi basin in 1948, amounting to Rs. 18,000/11/4. You will notice that the top copy of this account has been certified by London Chartered Accountants

Yours faithfully,
for ASSOCIATED CONSULTING ENGINEERS (INDIA),
Sd/- xx.

Encl: (typed herebelow).

ASSOCIATED CONSULTING ENGINEERS(INDIA),
Queen Anne's Lodge,
Westminster,London S.W.1.
25th February 1949.

ACE/180.

BOMBAY ELECTRIC GRID
Dr. to Associated Consulting Engineers(India).

REPORT ON RIVER GAUGING OPERATIONS IN THE KALINADI BASIN, BOMBAY PRESIDENCY.

TO Fees and expenses for professional services rendered in preparing report submitted 8th November 1948.

Technical salaries.

	Rs. a. p.	Rs. a. p.
In India	4,463-11-6	
In United Kingdom.	933- 5-4	5,397- 0-10.
100% to cover clerical staff and general overhead expenses		5,397- 0-10
		10,794- 1- 8
Travelling and Hotel expenses and living expenses of staff outside Bombay.		2,499- 5- 4
Hotel and other expenses of Mr.K.V.Rama Rao,		118- 7- 0
Servants, coolies and cost of site labour and expenses,		1,506- 0- 0
Printing and reproduction of documents, drawings and records.		384- 5- 4
25% of salaries and Oncost for services of partners and remuneration of firm,		2,698- 8- 0
Rs.		18,000-11- 4

We have examined the above Account and are of the opinion that the charges represent the true cost in accordance with the terms of agreement between Associated Consulting Engineers (India) and the Bombay Electric Grid.

(Sgd). F.W.Stephens & Co.,
CHARTERED ACCOUNTANTS.

Liverpool House,
15/17, Eldon Street,
London, E.C. 2.

4th March 1949.

ARK.22.7.49.

No.Elg.12-A/ 12597
Electric Grid Offices,
Foreshore Road,
Bombay 1: 29th July, 1949.

VERY URGENT
Letter

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject: Kalinadi Hydro-Electric Project - Preliminary Investigations.
Reference: Government Resolution, Public Works Department, No. 8340/36, dated 28-10-1947.

Government were pleased to sanction the preliminary investigations on the Kalinadi Hydro-electric Project at an estimated cost of Rs. 1,65,000/- (vide G.R. under reference). A copy of the final Report on the Hydro Electric Resources of the Kalinadi basin prepared by Messrs. Associated Consulting Engineers, (India) was duly submitted by me to Government, (vide my letter No. ELG-12-D/3855, dated 7th March 1949).

2. The work of aerial survey was entrusted to the Government of India, Survey Department, at an estimated cost of Rs. 15,000. That department informed us while submitting the final bill that their charges had increased to Rs. 19,985, due to increase in the contoured area and increase in the charges of labour and material. It was also decided to preserve with them for five years the negatives of the photomosaics as the charges for this as mentioned by the Survey Department were nominal, i.e. Rs. 249/-. Therefore, the cost of aerial survey is Rs. 20,234/-.

3. The Consulting Engineers had estimated that the cost of trial pits and bores would be Rs. 45,000 and their final cost, given in their letter No. ACE/113, dated 16-6-1948, is Rs. 44,774 (copy enclosed).

4. The Consulting Engineers had originally estimated that, provided the field work could be completed in one working season, they would accept the fixed upper limit to the total sums to be paid to them under the following items amounting to Rs. 1,05,000/-.

(a) Actual cost of salaries and allowances paid to each member of the technical staff engaged on the work in

India and in the U.K..

(b) An amount equal to 80% of item (a) to cover clerical staff and general overhead expenses.

(c) An amount equal to 25% of the sum of items (a) and (b) to cover the remuneration of the Consulting Engineers.

(d) All out-of-pocket expenses actually and necessarily incurred in connection with the work in respect of -

(i) Travelling expenses between the U.K. and Bombay.

(ii) Travelling expenses in India.

(iii) Moving expenses incurred by the staff during the site investigations.

(iv) Printing and reproduction of documents, drawings, and records and the purchase of maps.

v) Fees for legal advice taken or sought on behalf of Government, specialists' services, laboratory investigations and overseas telegrams.

As the work could not be completed in one working season, a total claim of Rs. 1,68,210 was preferred by the firm. The firm was asked to furnish details of itemised costs which were included in the lump sum figure of Rs. 1,05,000 and the increase in each of these, giving the reasons therefor. These were intimated to me by the firm in their letter No. ACE/113, dated 28-1-1949 (copy enclosed). The details furnished were fully scrutinised and discussed with the representatives of the firm and they agreed that charges incurred by them on account of salaries in India and in the U.K. in excess of their original estimate based on one season's full work, should be reduced by 50%. They also agreed to reduce the Consulting Engineers' remuneration on the expenditure incurred in excess of the original estimated amount from 25% to 12½%. In respect of remaining items, the firm is not in a position to reduce any charges, which are based on the actual out of pocket expenses incurred by them

solely for the Kalinadi work. Accordingly, in their letter No. ACE/113/190/180, dated 8-4-1949 (copy enclosed) Messrs. Associated Consulting Engineers (India) have amended their original estimated cost from Rs. 1,68,210 to Rs. 1,70,951, have furnished a revised schedule (after reductions as mentioned above) for this work amounting to Rs. 1,45,064 and have thus reduced the total charges by Rs. 25,887.

The main reasons for this extra cost are -

(i) Delay in completion of boring work.

(ii) Delay in receipt of conteured mosaics from the Survey of India Department, owing to depletion of their staff following Partition in 1947.

5. A supplementary estimate amounting to Rs. 8,000/- for gauging the Kalinadi and the Kaneri rivers and taking observations of velocities of these rivers by means of current meter to obtain stage discharge relations was sanctioned by Government under Government Resolution, P.W.D., No. 8340/36, dated 18-8-1948. The work was entrusted to Messrs. A.C.E.(I). In their letter No. ACE/180, dated 31-8-1948 (copy enclosed), the firm informed that from actual experience gained when the work was carried out, this work would cost Rs. 15,500/-. In their letter No. ACE/180, dated 8-6-1949, (copy enclosed), the firm have now intimated that the cost amounted to Rs. 18,001/-.

The reasons for this increase in cost are :-

(i) The work had taken 12 weeks instead of the originally estimated 4 weeks due to the fact that the monsoon rains had failed in the middle of the period and the river level went down at a time when it was hoped that higher readings could be taken.

(ii) The commencement was also delayed as the current meter in question was not cleared from the customs in Bombay.

(iii) The firm had to engage some more labour than was previously estimated.

The work was completed by the firm at the end of August 1948, and their report on these operations was received in November 1948, and is being scrutinised.

Regarding the reference made in their letter No.ACE/180, dated 8-6-1949, to the cost ~~xx~~ amounting to Rs. 118/- on account of living expenses of Mr. Rama Rao (the Junior Engineer of this Department who was deputed to work with the firm on these observations), Government has been separately approached for the necessary sanction to pay Mr. Rama Rao the increased daily allowance for the full period. On receipt of this sanction from Government, M/s. A.C.E.(I) will be reimbursed to this extent. Therefore, the net cost of this estimate payable to A.C.E. (I), would be Rs. 17,883/-.

6. To collect further data in regard to the scheme, it has been found necessary to continue departmentally these river gauging operations. The estimated expenditure on the following works is, therefore, included :-

One gauge clerk has been engaged to record the gauge readings on the Kaneri river at the Gund Causeway for 4 monsoon months of the year commencing from June 1948. The cost of this works upto Rs. 830/-, for a period of two years, including ~~xx~~ maintenance and other charges.

(b) The Depot Officer, Dandeli, has been asked to take gauge readings at Dandeli on the Kalinadi river at Rs. 3/-p.m. The estimated cost for this for ~~six~~ two years is Rs. 72.- Therefore, the total estimate for river gauging operations is Rs. 902/-.

7. A revised estimate amounting to Rs. 2,28,900/- showing all the above items is enclosed herewith and I request that Government may please be moved to sanction this estimate as early as possible, so that amounts due to Messrs.A.C.E.(I) for works already done may be paid early.

8. With reference to further detailed investigations for the Supa power station part of the Kalinadi Scheme (vide para 2 of letter No.ACE/113/190/180, of 2-4-1949 referred to in para 4 above), I shall separately write to Government in continuation of my letter No. Elg.12-D/3855, dated 7-3-1949 (para 6) referred to in para 1 above.

P. B. Advani

Encls: One estimate
Five letters (copies)

Electrical Commissioner
with the Government of Bombay

Very Urgent
letter.

No. H7-3/ 14147
Electric Grid Offices,
Foreshore Road,
Bombay 1 : Aug. 1949.

29

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject: Kalinadi Hydro Electric Project--
Preliminary Investigations.

Reference: letter No: Elg. 12-A/12507 dated
29-7-1949.

In continuation of my above letter, I request you to move the Government to sanction as early as possible, the revised estimate amounting to Rs.2,28,900/- in connection with the preliminary investigations on the Kalinadi Hydro Electric Scheme as Messrs. Associated Consulting Engineers (India) are pressing for payment for the work completed by them.

P. B. Advani,
Electrical Commissioner
with the Government of Bombay.

GOVERNMENT OF BOMBAY.

PUBLIC WORKS DEPARTMENT.

Resolution No. 8340/36.

Bombay Castle, 28th October 1947.

Letter from the Special Officer (Electric Grid), No. Elg. 12-A-7415, dated the 27th December 1946, as under:—

"In the Press Note, dated 18th November 1946, and the Blue Book on Post-War Reconstruction Planning, 1944, it has been stated that Kalinadi Hydro-Electric Development will be taken up in due course. In the provision of 8·46 crores of rupees, made for the Grid Schemes, certain amount is intended to be utilised for the development of the Kalinadi Project and/or making power available from Jog—*vide* paragraph 2 (*a*) of my letter No. Elg. 1(II)/6755, dated 20th November 1946. Before the question of undertaking the Kalinadi development can be considered, it is essential to have a Project Report prepared on it. In the case of Koyna, very considerable amount of work had been done by Tatas, and therefore, it was possible to recommend to Government the undertaking of a detailed survey to enable the preparation of estimates and later designs in connection with that Hydro-Electric Development. As regards Kalinadi, it is true that certain amount of preliminary work was done by Mr. Bowers considerable time back, but that work cannot be considered sufficiently comprehensive or detailed to enable a decision being taken that the scheme is technically and economically feasible and that, therefore, relatively high expenditure involved in a detailed survey for the purpose of preparation of estimates and designs will be justifiable. In the case of Kalinadi, therefore, it is necessary to arrange for the preparation of a Project Report in the first instance. If this Report is satisfactory, a detailed survey to enable the preparation of estimates and designs for the development of the scheme may be undertaken.

"2. The present resources of the Grid Department are extremely limited. In view of the very considerable amount of work in hand, the latest being Koyna Survey, which has been sanctioned by Government, it will be quite impossible to carry out the necessary work in connection with the preparation of a Project Report of Kalinadi. I have discussed this matter with the Honourable Minister, Public Works Department, and subsequently with the local representatives of one of the largest British firms of Consulting Engineers, viz.. Associated Consulting Engineers (India). I now submit herewith in original (1) a D.O. letter No. ACE/P113, dated 16th December 1946, addressed by the Chief Engineer of the firm to me, and (2) the firm's official letter* of the same reference and of the same date. These two letters are self-explanatory. I would recommend that Government be pleased to authorise me to ask the firm to undertake the work on the lines outlined on page 2 of their official letter, on the terms indicated in the letter.

"3. It will be noted that the estimated cost of the work in question is Rs. 1,78,000. In this connection, I would state that while there is a possibility of some saving in connection with the cost of aerial survey, there is also a possibility of increase in the charges connected with the Consultants' fees, as the work may not be finished in one season, for causes beyond the Consultants' control. I am of the opinion that the estimate submitted is reasonable. This firm of Consulting Engineers has very wide experience of this kind of work in the different parts of the world and we may expect to get a very valuable and reliable Report from them. I send herewith for information a copy of their recent Report on River Lar Project carried out for the Government of Iran. This may kindly be treated as confidential and returned when done with, as it is to be given back to the firm. The Southern part of this Province has been somewhat neglected in the matter of industrial and electrical development. Kalinadi may prove to be an excellent source of cheap power round which industrial development may become possible.

"4. It will be noted from the Demi Official letter, referred to above, that if advantage is to be taken of the present fair season, the decision of Government must be communicated to the Consultants and through them to the Surveyor General for aerial survey as soon as possible. If this is not done, one year will be lost and the work cannot then be undertaken till the beginning of 1948.

"I shall accordingly be obliged for the issue of the orders of Government at a very early date."

Government Letter No. 8340/36-El.(I), dated the 7th January 1947, to the Special Officer (Electric Grid), as under:—

"Reference: Your letter No. Elg. 12-A./7415, dated the 17th December 1946.

"2. Government approves your proposal to entrust the work of preparation of a Project Report in respect of the Kalinadi Hydro-Electric development to Messrs. Associated Consulting Engineers (India), on the lines and terms indicated in their letter No. ACE/P. 113, dated the 16th December 1946, to your address.

*Printed as an accompaniment to this Resolution.

" 3. The expenditure, which should be debited to the head ' 52-A ', is authorised in anticipation of the sanction of the Legislative Assembly. Please report by the 15th February 1947 at the latest the amount required to be spent during the current financial year.

" 4. The Report on River Lar Project received with your letter is returned herewith."

Letter from the Special Officer (Electric Grid), No. Elg. 12-A./1489, dated the 14th February 1947, as under :—

" Reference : Government letter, Public Works Department, No. 8340/36-El.(I), dated 7th January 1947.

" In the letter quoted above Government have approved the proposal to entrust to Messrs. Associated Consulting Engineers (India), Bombay, the work of preparing a Project Report in respect of the Kalinad Hydro-Electric Scheme at a total cost of Rs. 1,78,000 on terms and conditions indicated in their letter No. ACE/P. 113, dated 16th December 1946 (copy enclosed). From the nature of the work involved, it is doubtful if it falls under the category of ' Work ' proper as defined in paragraph XXI of Public Works Department Manual, Volume I, page 3. The details for Rs. 1,78,000 as given by the firm are noted below :—

	Rs.
(1) Aerial Survey	38,000
(2) Trial pits and bores	35,000
(3) Payment to Consulting Engineers (Maximum)	1,05,000
	1,78,000

Items (1) and (2) may probably be classified as ' Work ' proper as defined in the Public Works Department Manual, but as this has to be executed by the firm to collect certain data required for preparing the Project Report and is not subject to any check by this Department and as there is no stipulation regarding the number of bores, trial pits and their depths and the rates for the same, they are not susceptible of payment on the basis of measurements. Under the circumstances, the entire work is not classifiable as ' Work ' proper, for which detailed estimates and plans can be prepared and hence it may be classified under Contingencies of the Department. Although the expenditure is classified under major head 52-A, Other Revenue Expenditure, no minor head has been stated. I therefore request that detailed classification of the proposed expenditure may be indicated.

" 2. Regarding payments, it has been agreed that the firm should present their bills each quarter covering the expenditure on :—

(*a*) Actual cost of salaries and allowance paid to each member of the Technical Staff, engaged on the work in India and the United Kingdom.

(*b*) An amount equal to 80 per cent. of item (*a*) to cover the clerical staff and general over head expenses.

(*c*) All out of pocket expenses actually and necessarily incurred in connection with the work, such as, travelling allowance, living expenses, printing, etc., and fees for legal advice taken or sought.

" 3. After submitting the Project Report, the firm will submit final accounts certified by a firm of Chartered or Registered Accountants in respect of the expenditure. The first quarterly payment will be made sometime in April 1947 and hence no amount is required for payment during the current financial year. But provision of Rs. 1,78,000 will have to be made in the ensuing year's budget and I request that this may kindly be provided in the budget for 1947-48."

Memorandum from the Accountant General, Bombay, No. P.W.III 408, dated the 25th March 1947, stating as follows :—

" * * *

" 2. It is only in the case of a Civil Department that the expenditure on construction and Repair works is classified as Contingent expenditure of the Department, *vide* Rule 154 of the Financial Publication No. I, subject to the limit prescribed therein. As however the accounts of the Special Officer, Electric Grid, are maintained on the Public Works Department system and as the proposed expenditure will form part of the project estimate, it has to be classified under the sub-head ' (*a*) Original works (1) Electric Schemes ' of the minor head ' Miscellaneous Expenditure (including surveys) ' under ' 52-A ', opened as per orders contained in Government Circular Memorandum, Public Works Department, No. 6786/36(2), dated 6th November 1946.

" 3. If the items of works are not susceptible of detailed measurements intermediate payments in respect thereof can be made on lump sum contract form, on a certificate furnished by a competent responsible officer and without recording the detailed measurements in a Measurement Book, *vide* paragraph 322 of the Bombay Public Works Department Manual, Volume I. But an estimate for the work giving the details of the probable cost of Rs. 1·78 lakhs will have to be prepared and sanctioned by the competent authority

(*vide* paragraph 129 of the Public Works Department Manual) so that the final accounts to be submitted by the Firm on the completion of the work may be checked with reference to those details."

Read letter from the Special Officer (Electric Grid), No. Elg. 12-A/3704, dated the 14th April 1947.

Government Letter No. 8340/36-El., dated the 30th May 1947, to the Electrical Commissioner with the Government of Bombay, as under :—

" Reference : Your letters No. Elg. 12-A/1489, dated the 14th February 1947, and No. Elg. 12-A/3704, dated the 14th April 1947.

" 2. Your proposal to classify the expenditure under ' Contingencies ' cannot be accepted. A copy of the remarks of the Accountant General, Bombay, in the matter (No. P.W.III. 408, dated the 25th March 1947), is enclosed for your information. As pointed out by the Accountant General the expenditure should be classified under the sub-head ' (*a*) Original Works (1) Electric Schemes ' of the minor head ' Miscellaneous Expenditure (including Surveys) ' under the major head ' 52-A ' and an estimate for the work giving the details of the probable cost should be prepared and got sanctioned by the competent authority as required by paragraph 129 of the Public Works Department Manual Volume I.

" 3. Government has no objection to the monthly payments of the bills in connection with boring works to Messrs. Associated Consulting Engineers (India).

" 4. The necessary allotment to meet the expenditure during the current year will be made in due course."

Letter from the Electrical Commissioner with the Government of Bombay, No. Elg. 12-A/6589, dated the 7th July 1947.

Forwards a copy of letter* No. ACE/113, dated the 23rd June 1947, from Messrs. Associated Consulting Engineers (India), and states as follows :—

" The revised estimate under alternative A may be accepted, as the firm are definite that percussion and core boring will be sufficient for the purpose of their report. The maximum cost of the work that will be possible to carry out before the submission of the report would be Rs. 45,000. For comparison, the original and revised estimate of the 3 items submitted by the firm are noted below :—

Items.	Previous estimate.	Revised figure.
	Rs.	Rs.
(1) Aerial surveys ...	38,000	15,000
(2) Trial pits and bores ...	35,000	45,000
(3) Payments to Consulting Engineers (maximum) ...	1,05,000	1,05,000
Total ..	1,78,000	1,65,000

The cost of aerial surveys has been reduced according to the figures given by the Government of India Survey Department, and the cost of trial pits and bores increased on the basis of latest quotation received by the firm from the contractors.

The above figures may be considered as tentative until they are finalised after the report is received on the respective works."

Government Letter No. 8340/36-El., dated the 24th July 1947, to the Electrical Commissioner, with the Government of Bombay, as under :—

" Reference : Your letter No. Elg. 12-A/6589, dated the 7th July 1947.

" 2. Government agrees to your proposal to accept the revised estimate of Rs. 45,000 for trial pits and bores under alternative ' A ' suggested by Messrs. Associated Consulting Engineers (India), in their letter No. ACE/113, dated the 23rd June 1947, to your address. Apparently your intention is to adopt the revised figures communicated in your letter under reference for the purpose of preparing a detailed estimate for the sanction of competent authority as instructed in paragraph 2 of Government Letter No. 8340/36-El., dated the 30th May 1947. Government has no objection to your doing so. The return of the estimate should be expedited."

Letter from the Electrical Commissioner with the Government of Bombay, No. Elg. 12-A/7697, dated the 6th August 1947, as under :—

" Reference : Government letters, Public Works Department, No. 8340/36-El., dated 30th May 1947 and No. 8340/36-El., dated 24th July 1947.

" With reference to above and in continuation of this office No. Elg. 12-A/6589, dated 7th July 1947, I enclose herewith an estimate for the preliminary investigations and submission of a report on the Kalinadi Hydro-Electric Project prepared from the details and costs as submitted by the Associated Consulting Engineers (India). As stated in this office reference No. Elg. 12-A/1489, dated 14th February 1947, there is no stipulation in the agreement regarding the actual costs of surveys, bores and trial pits or other expenses on salaries, wages travelling and other allowances, etc., and the estimate has to be based on lump sum figures given by the firm. Under these circumstances, I request that the same may be accepted and necessary administrative approval and technical sanction accorded."

*Printed as an accompaniment to this Government Resolution.

RESOLUTION.—The estimate amounting to Rs. 1,65,000 for the preliminary investigations and report on the Kalinadi Hydro-Electric Project is approved administratively and sanctioned technically.

By order of the Governor of Bombay,

G. G. DHANAK,
Deputy Secretary to Government.

G. R., No. 8340/36, P. W. D., dated the 28th October 1947.

To

The Finance Department.
The Commissioner, Southern Division.
The Electrical Commissioner with the Government of Bombay (with the estimate).
The Superintending Engineer, Southern Circle.
The Electrical Engineer to Government.
The Accountant General, Bombay.

No. of 1947.

Copy forwarded for information and guidance to

Accompaniments to Government Resolution, Public Works Department, No. 8340/36, dated 28th October 1947.

Copy of letter No. ACE/P. 113, dated the 16th December 1946, from Messrs. Associated Consulting Engineers (India), 534, Sandhurst Road, (Near the Bridge), Bombay 7, to P. B. Advani, Esquire, Special Officer, Bombay Electric Grid, Foreshore Road, Bombay, regarding Kalinadi Hydro-Electric Project.

We refer to our recent discussion with you when you asked us to examine the existing records relating to the scheme for developing the water power resources of the Kalinadi River as prepared by Mr. P. L. Bowers in 1921, and thereafter submit our general views together with our proposals for undertaking a more detailed investigation.

We now have pleasure in reporting that we have carefully examined the papers, plans and records which you have kindly placed at our disposal and we have reached certain broad conclusions which may be summarised as follows:—

(1) The ultimate power resources of the Kalinadi River basin appear to be much greater than was contemplated at the time Mr. Bowers' drew up his scheme.

(2) The extent to which development is economically justified depends largely on the possibility of securing good storage sites on the Pandri, Kalinadi and other streams.

(3) The Bowers' scheme makes only a partial use of run-off from 600 square miles of catchment area—only 107 square miles of which are reservoired. No reference in the Report is made to possible storage sites on the Pandri.

(4) The site selected by Mr. Bowers for a dam on the Kalinadi appears (subject to geological examination) to lead to economical storage and to be suited to the adoption of an arch dam which in turn should lead to economies in construction.

(5) The Bowers' scheme was based on the adoption of an open, high level canal system, and the possibility of substituting a continuous pressure adeduct—wholly or mainly in tunnel—should be investigated along with other alternatives.

A perusal of the records relating to the scheme indicates that a great deal of valuable work has already been done and a considerable mass of rainfall and other data collected. The proposals prepared by Mr. Bowers appear, however, to visualise only a partial development of the resources of the Kalinadi River basin and were no doubt, conceived against a background of industrial development which has radically changed in quarter of a century which has elapsed since they were first drawn up. The n for careful planning in the development of the water power resources of India is much more insistent than was the case 25 years ago, and it is suggested that be attempting to reach any decision with regard to the Kalinadi Scheme, Government sh undertake a complete re-examination of the area with the object of drawing up which would envisage the ultimate utilisation of the whole of the regional resource

Such a plan we suggest should outline the gradual development of the Kalinadi basin in a series of stages which could be carried out over a period of years to me increasing needs for electric power. Those parts of the scheme which could be c out most economically and rapidly would be programmed for early developmen

proposals as a whole forming a single scheme designed to make the fullest use of the latent resources of the area.

The work which we would undertake would include :—

(*a*) Examination and correlation of all existing data relating to the rainfall, run-off and available power, and studies of similar data from other catchment areas where climatological conditions possess characteristics in common with those of the areas under examination.

(*b*) The collection of any additional data considered necessary for the formulation of reliable estimates of available power.

(*c*) Economic studies of alternative storage sites based upon the cost of constructing reservoirs and a consideration of the varying flow of the streams at different seasons of the year.

(*d*) Studies of alternative methods of utilising the power resources of the areas and the extent to which development is justified on economic grounds.

(*e*) The preparation of a general scheme of development and the production of plans and drawings showing the location of the proposed works.

(*f*) The preparation of estimates of the cost of carrying out the proposed works and recommendations as to the order in which they should be executed in order to meet an expanding demand for electric power.

(*g*) Studies of installed plant capacities in the various power stations to be included in the ultimate scheme of development.

(*h*) Estimates of the operating charges and the total cost of producing power at various load factors.

We shall be very glad to undertake such a comprehensive investigation for your Government, and for this purpose we are prepared to import to this country from our own staff in the United Kingdom such experienced engineers as may be necessary to supplement the local technical resources of our own Indian organisation.

With regard to the remuneration for our services, it is, as we pointed out to you, difficult to quote an over-all lump sum fee although we appreciate that for purposes of financial sanction your Government will naturally wish to know in advance the full extent of their commitments.

Our usual practice where the full scope of the work is difficult to assess in advance, is to adopt a time basis and to charge an agreed percentage on the salaries and expenses of the staff actually employed on the work. We suggest that this method might be adopted in the present instance with the proviso that the total sum to be paid to us for our services should not exceed an upper limit.

The total cost to Government of preparing a Project Report may be divided into two parts :—

(A). Items of expenditure paid for direct at actual cost.

(B). The work undertaken by the Consulting Engineers and paid for on a time basis with a fixed upper limit.

Expenditure under (A) will include :—

(*a*) Cost of aerial survey and the preparation of contoured maps.

(*b*) Cost of trial bores and pits.

(*c*) Payments (if any) made to the Indian Geological Survey Department in connection with a Geological Report.

We propose that the Consulting Engineers should be remunerated for their services under (B) on the following basis :—

(*a*) Actual cost of salaries and allowances paid to each member of the technical staff engaged on the work in India and in the United Kingdom.

(*b*) An amount equal to 80 per cent. of Item (*a*) to cover clerical staff and general overhead expenses.

(*c*) An amount equal to 25 per cent. of the sum of Items (*a*) and (*b*) to cover the remuneration of the Consulting Engineers.

(*d*) All out-of-pocket expenses actually and necessarily incurred in connection with the work in respect of :—

(i) Travelling expenses between the United Kingdom and Bombay.

(ii) Travelling expenses in India.

(iii) Living expenses incurred by the staff during the site investigations.

(iv) Printing and reproduction of documents, drawings and records and the purchase of maps.

(v) Fees for legal advice taken or sought on behalf of Government, specialists' services, laboratory investigations and overseas telegrams.

All accounts would be certified by a firm of Chartered Accountants.

We have prepared an estimate of the costs which are likely to be incurred under (B) above, and, provided the field work can be completed in one working season, we would be prepared to accept a fixed upper limit to the total sums to be paid to us under Items (*a*) to (*d*) above of Rs. 1,05,000 (Rupees One Hundred and Five Thousand).

We have also made an estimate on the basis of the information at our disposal of the cost of carrying out an aerial survey and preparing the necessary contoured maps. Assuming that the total area to be covered by the surveys extends to 800 square miles, we estimate that the maximum cost of preparing the necessary maps would be approximately Rs. 46,000 (Rupees Forty-six Thousand). It is likely, however, that some economy could be effected since it will probably not be necessary to contour the whole of the area which will be photographed. We suggest, therefore, that a lower limit for the cost of the aerial surveys might be taken as Rs. 30,000 (Rupees Thirty Thousand) and, for purposes of arriving at an over-all figure for the cost of the Project Report, we have adopted a mean figure of Rs. 38,000 (Rupees Thirty-eight Thousand).

We might add that we have been informed by the Director, Southern Circle, Survey of India, that he anticipates the area of the Kalinadi basin will be included as part of his Department's programme for the Spring of 1947. In this event there would be no charge made for the production of maps on a scale of 1-inch to 1 mile, and there is, therefore, the possibility that the cost to Government of the necessary aerial surveys would be reduced to about Rs. 14,000 (Rupees Fourteen Thousand) only, to cover the cost of the large scale surveys of certain of the areas.

Until the sites of the principal works have been cleared of jungle it is very difficult to estimate the expenditure likely to be incurred under the heading of trial bores and pits, but on the understanding that much of the area consists of exposed rock, we have allowed a provisional sum of Rs. 35,000 (Rupees Thirty-five Thousand).

With regard to the geological survey, it is, we believe, the practice of the Department to make no charge for their services where work is carried out on behalf of Government.

On the foregoing basis the total cost to Government would be Rs. 1,78,000 (Rupees One Lakh Seventy-eight Thousand) made up as follows:—

	Rs.
Aerial Survey	38,000
Trial Bores and Pits	35,000
Geological Survey (free of cost)	.....
Payments to Consulting Engineers (maximum)	1,05,000
	1,78,000

In considering this expenditure it is necessary to bear in mind the ultimate scope of the developments to be covered by the Report. The total cost of fully exploiting the resources of the Kalinadi River basin might well exceed 12 Crores of Rupees so that the cost of preparing a comprehensive scheme of Development would represent only about one-seventh of one per cent. of the capital expenditure envisaged. It will be appreciated, too, that this expenditure (Rs. 1,78,000) relates to investigations covering a very much greater area (800 square miles as compared with 107 square miles) than that which we had in mind when we wrote to you on 1st October last, suggesting that the cost of preparing a Project Report would be about Rs. 65,000 for a scheme costing 3·4 Crores of Rupees.

With regard to the time required to complete our investigations and submit our Report, we estimate that, provided instructions are received in time to permit the field work to be completed in the forthcoming working season, about four (4) months would be necessary after receipt of the contoured survey maps.

We have so far made no reference to the subject of electrical transmission, and we have presumed that in reporting to you on the development of the Kalinadi River basin, you would not wish us at this stage to deal with this aspect of the matter. In preparing our estimate of fees for the work we have therefore made no allowance for investigating the cost of transmission or interconnection with other power stations, and we suggest that this is a matter which might subsequently form the subject of a separate report."

Copy of letter No. ACE/113, dated 23rd June 1947, from Messrs. Associated Consulting Engineers (India), Bombay 7, to the Bombay Electric Grid, Foreshore Road, Bombay, regarding Kalinadi Hydro-Electric Scheme, Estimated Cost of Borings.

We refer to your letter of the 18th June reference No. Elg. 12-A/5938, asking for our estimate for the final cost of boring work.

We would stress that it is impossible to estimate with any accuracy the amount of boring required in an area where no previous subsurface examination has been carried out. This applies only to the percussion borings to determine the level of the rock surface. With the rock borings, on the other hand, it has been possible for Mr. Auden, the Government of India Geologist, to be fairly precise in his recommendations.

Furthermore two other factors make it even more difficult to estimate the amount of work to be carried out and, therefore, the cost. Firstly the boring contractor eventually reached the site six weeks later than he promised and since then progress has been very slow owing to insufficient supervision of his staff on the site. This means that only a small portion of the work can be completed before the monsoon and it is very uncertain how much work can be undertaken after the monsoon before our Report is

prepared. Secondly Mr. Auden's recommendations allow for much more boring and subsurface exploration than we consider is necessary for a project report of the type we are preparing. There will be neither the time nor, we consider, the need, to carry out his full programme for 870 feet of rock boring.

Owing to these uncertainties we are giving below two alternatives. We hope that they are sufficiently fully explained for you to decide which you will submit to Government.

Alternative A.

Percussion and core boring sufficient for the purposes of our report and the maximum that it will be possible to carry out before the submission of our report—Rs. 45,000.

Alternative B.

Full boring programme including additional checks on the rock surface level by percussion borings and all the rock borings recommended by the Geologist. This programme cannot be completed before the submission of our report—Rs. 75,000.

It would be normal practice for alternative A to be adopted because the additional work under alternative B which is estimated to cost another Rs. 30,000 would be part of the boring programme which you would authorise if it was decided to proceed with detailed design and construction consequent upon the consideration of our Project report.

Summarising the estimates of costs of aerial survey and borings the position is as follows :—

1. Original estimate—

	Rs.
Aerial Survey	38,000
Borings	35,000
Total ...	73,000

2. Latest estimates—

	Rs.
Aerial survey Rs. 10,000 to Rs. 15,000 say	15,000
Boring alternative A	45,000
Total ...	60,000

8340/36/56702.

El.Br.(I). P.W.D.

In May last, the El. Commr. approached Govt. with the proposal of entrusting to M/S. Associated Consulting Engrs. (India), the work of river gauging operations at Dandeli to measure discharges and that of further silt sampling in connection with the K i Project. It was proposed to accept his proposals which have also been agreed to by the R.C.D. and F.D. The El. Commr. has, however, since withdrawn his proposals as it would not be possible to commence the work this year due to the setting in of the monsoon. No action is necy. in this connection.

2. The El. Commr. now requests the approval of Govt. to the revised estimate amounting to Rs.2,28,900/- in connection with the preliminary investigations on the Kalinadi Hydro-Electric Scheme. The revised estimate is arrived at as follows :-

	Rs.
(a) The cost of aerial survey	20,234
(b) The cost of percussion drilling and core boring	44,774
(c) Revised cost of work for purely investigation and report on the project.	1,45,064
(d) Revised cost of work for gauging the Kalinadi and Kaneri rivers and taking observations of velocities of rivers.	17,883
(e) Expenses for collection of gauge observations of Kalinadi and Kaneri, viz., staff, maintenance charges etc.	902
	2,28,857

3. Govt. has so far sanctioned two estimates of Rs. 1,65,000 and Rs. 8,000 for preliminary investigations of the Kalinadi Project and for gauging the Kalinadi and Kaneri rivers - vide, G.Rs. No. 8340/36, dt. the 28-10-'47 and the 18-8-1948.

4. .....

4. The work in para 2(a) was entrusted to the India Survey Deptt. and the works in para 2(b), (c) and (d) above were entrusted to M/S. Associated Consulting Engrs. (India), at estimated cost of Rs. 15,000, 45,000 1,05,000 and 15,500 respectively. The increase in these estimates, as mentioned by revised figures in para 2 overleaf, is due to the following reasons :-

(a) Increase in the contoured area and increase in charges for labour and materials in respect of aerial survey work.

(b) Preliminary investigation and report thereon took longer and could not be completed in one working season as anticipated, due to delay in completion of boring work and delay in receipt of contoured mosaics from the Survey of India Deptt. owing to depletion of their staff following Partition in 1947.

(c) The work of Kalinadi and Kaneri river gauging could not be commenced earlier due to non-clearance of current meter from the customs in B'bay. and took longer period to be completed due to failure of the monsoon in the middle of the period. The firm had consequently to engage more labour than anticipated.

5. Amount of Rs. 902/- mentioned in para 2 (d), above is required for remuneration of a clerk and Depot Officer, Dandelli, to take gauge readings on Kaneri river and at Dandeli on Kalinadi river respectively for a period of two years. The details in this connection are given in the estimate on p. 23 ante.

6. In the circumstances, the revised estimate of Rs. 2,28,900 for preliminary investigations of kalinadi Project, which Govt. has decided to go ahead with, may be approved as per draft put up for approval, in U.O. consultation with the R.C.D. and the F.D.

7. With reference to para 8 of the El. Commr's letter on pp 41-44 ante, it is stated that Govt. has since decided that the detailed survey and exploratory work leading to and preparation of project report of the first stage of Kalinadi development at Supa should be carried out and the El. Commr. has been asked in G.L. No. 8340/36-El, dt. the 1-6-49, to submit for the approval of Govt., detailed proposals and estimated cost for the proposed work connected with the development of Supa part of the Kalinadi Scheme. Necy. action in that con: will be taken separately when the requisite proposals are recd. from the El. Commr.

8. ...

8. The papers will be submitted to the H.M., P.W.D. on their return from ~~the R.C.D. and~~ the F.D. to which Deptt. they are proposed to be refd. U.O.

Thro: A.B.(II), ~~E.B.(I)~~ and (II) and D.E.(I).

× Pl. to co-plete the Gr. fa.

Δ w.n.t. A' on pg 44 ante w.r.t. para 5 of O.N.

2. RKP 5-9-49.

S.A.J. 28-9-49

183 5-9-49

9. Expdre. on the preliminary surveys of Hydro-Electric projects was hitherto debited to the head '52-A'. In view of the orders issued in G.R.No. 7993/36, dt the 9-5-1949, it is now to be debited to the head "81-A. Capital Outlay on Electricity Schemes" — vide F.D. note at p 18 ante. As the preliminary survey of the project has already been approved by the L.A. as this involves only a change of the head, it does not seem necy. to bring this to the notice of the L.A. again. Expdre. on the survey may therefore be authorised during the current year under the head "81-A - Capital Outlay etc. and the El. Comm. may be asked to report the actual amount regd

early in Jany. 1950 when a source to meet the expdre. will be found out.

29.9.49.

29.IX.49.

29/9/49

30.9.49.

No. 6 dated 14th Oct 1949.

Finance Deptt.
Per R. I

The estimates mentioned at para 2 (a), (b) and (c) of the foregoing note, exceed the original ones by Rs. 45,000. The estimate at para 2 (d) exceeds the sanctioned one by Rs. 10,000 approx. The excess in respect of the last estimate has been approved by this deptt. (vide F.D. note d. 29.6.49 The amount at 2 (e) is negligible. However, it is seen from the details at p. 23 ante that this estimate is reasonable.

2. The reasons for the excesses have been explained in para 4 of the foregoing note. In view of this the proposal in para 6 may be accepted.

20.10.49.

3. The work of preliminery survey of Kalinadi Hydro-Electric Project was approved by the Legislative Assembly during September 1947 session, at an estimated cost of Rs. 1,78,000. In this connection, please see para 2 of this

p. 18

p. 18

Department note dated 30-6-49. The E.P.C. has also approved in principle to detailed survey and exploratory work for the preparation of the Project. The revised estimate of the work now amounts to Rs. 2,28,900.As the L.A. has already approved to this expenditure in September 1947, it is not necessary to bring it to its notice again by means of a supplemmentary demand.

31-10-49

5/11/49

E1(2) 9/11

P. W. D.
FEc No. 8340/36.
Serial No. 73864

Copy of GR may be supplied if B(I)

Kalinadi Hydro - Electric Project:
Preliminary investigations.

GOVT. OF B'BAY.
P. W. D.
Resolution No. 8340/36.
B.C., ~~16 Sept.~~ 13th Dec. 1949.
(Bombay No. 1[illegible] ⊗

⊗ Changes made on instructions from Bch vide Supdt. El(I)'s note at the foot of p 63 post
CE
14/12/49.

Read G.Rs. No. 8340/36, dt. the 28-10-1947 and the 18-8-1948.

Letter No. ELG.12-A/12507, dt. the 29-7-1949, from the El. Commr. with Govt. of B'bay, as under :-

(E N T E R)

RESOLUTION :- The revised estimate, amounting to Rs. 2,28,900 for the preliminary investigations and report ~~in respect~~ of the Kalinadi Hydro-Electric Project is approved.

2. Expdre. on the investigations is authorised during the current year under the head "81-A - Capital Outlay on Elcty. Schemes", the El. Commr. should report early in Jany. 1950 the actual amount reqd. during the year, when a source to meet the expdre. will be pointed out.

By order etc.

The Commr., S.D.
The El.Commr. with the Govt. of B'bay (with the estimate).
The S.E., S.C.
The El. Engr. to Govt.
The A.G., Bombay (thro: the F.D.).

ASS
5-9-49.

Kfg 9/9/49

DJ.

2.
RKP
5-9-49.

Secy (I)

UG
30.9.49.

8340/36/73864.

El. Br-I. P. W. D.

Submitted.

2. The question at issue is to accord approval to the revised estimate amounting to Rs 2,28,900, subtd. by the El. Commr., in con. with the prely. investigations of the Kalinadi Hydro-El. Scheme. The proceedings on pp 55-ante explain the facts of the case. The F.D. has given its consent (p 58) in the matter. The draft G.R. within may now issue, if approved, after submission to the H.M. P. W. D. (p 61)

Thro' AB (III) & DEC (I).

21/11/49.

ASS 20-11-49

Plo 21/11/49

S.

Kj 21/11/49

Seen

H.M. P.W.D

23/11

23/11

Kj 23/11

The case was sent up on 15-11-49 with file no LC 47/46. & returned on 13-12-49 to Dr.

13/12/49

Kalinadi Hydro-Electric Projec

Preliminary investigations.

Government of Bombay.
Public Works Department.
Resolution No.8340/36.
Bombay Castle, ~~28th November 1949~~
(Bombay NO.I), 13th December 1949.

Read Government Resolutions No. 8340/36, dated the 28th October 1947 and the 18th August 1948.

Letter No. ELG.12-A/12507, dated the 29th July 1949, from the Electrical Commissioner with Government of Bombay, as under :-

"Reference:- Government Resolution, Public Works Department, No. 8340/36, dated 28th October 1947.

Government were pleased to sanction the preliminary investigations on the Kalinadi Hydro-electric Project at an estimated cost of Rs.1,65,000 (vide Government Resolution under reference). A copy of the final Report on the Hydro Electric Resources of the Kalinadi basin prepared by Messrs. Associated Consulting Engineers (India), was duly submitted by me to Government (vide my letter No. ELG-12-D/3855, dated 7th March 1949).

2. The work of aerial survey was entrusted to the Government of India, Survey Department, at an estimated cost of Rs. 15,000. That department informed us while submitting the final bill that their charges had increased to Rs. 19,985, due to increase in the contoured area and increase in the charges of labour and material. It was also decided to preserve with them for five years the negatives of the photomosaics as the charges for this as mentioned by the Survey Department were nominal i.e. Rs. 249/-. Therefore, the cost of aerial survey is Rs. 20,234/-.

3. The Consulting Engineers had estimated that the cost of trial pits and bores would be Rs. 45,000 and their final cost given in their letter No. ACE/113, dated 16th June 1948, is Rs. 44,774 (copy enclosed).

4. The Consulting Engineers had originally estimated that, provided the field work could be completed in one working season, they would accept the fixed upper limit to the total sums to be paid to them under the following items amounting to Rs. 1,05,000/-.

(a) Actual cost of salaries and allowances paid to each member of the technical staff engaged on the work in India and in the United Kingdom.

(b) An amount equal to 80% of item (a) to cover clerical staff and general overhead expenses.

(c) An amount equal to 25% of the sum of items (a) and (b) to cover remuneration the ~~remuneration~~ of the Consulting Engineers.

(d) All out-of-pocket expenses actually and necessarily incurred in connection with the work in respect of -

(i) Travelling expenses between the United Kingdom and Bombay.
(ii) Travelling expenses in India.
(iii) Living expenses incurred by the staff during the site investigations.
(iv) Printing and reproduction of documents, drawings, and records and the purchase of maps.
(v) Fees for legal advice taken or sought on behalf of Government, specialists' services, labaratory investigations and overseas telegrams.

As the work could not be completed in one working season, a total claim of Rs. 1,68,210 was preferred by the firm. The firm was asked to furnish details of itemised costs which were included in the lump sum figure of Rs. 1,05,000 and the increase in each of these, giving the reasons therefor.

These .....

These were intimated to me by the firm in their letter No. ACE/113, dated 28th January 1949 (copy enclosed). The details furnished were fully scrutinised and discussed with the representatives of the firm and they agreed that charges incurred by them on account of salaries in India and in the United Kingdom in excess of their original estimate based on one season's full work, should be reduced by 50%. They also agreed to reduce the Consulting Engineers' remuneration on the expenditure incurred in excess of the original estimated amount from 25% to 12½%. In respect of remaining items, the firm is not in a position to reduce any charges, which are based on the actual out of pocket expenses incurred by them solely for the Kalinadi work. Accordingly in their letter No. ACE/113/190/180, dated 2nd April,1949 (copy enclosed), Messrs. Associated Consulting Engineers (India) have amended their original estimated cost from Rs. 1,68,210 to Rs. 170,95., have furnished a revised schedule (after reductions as mentioned above) for this work amounting to Rs. 1,45,064 and have thus reduced the total charges by Rs. 25,887.

The main reasons for this extra cost are -

(i) Delay in completion of boring work.

(ii) Delay in receipt of contoured mosaics from the Survey of India Department, owing to depletion of their staff following Partition in 1947.

5. A supplementary estimate amounting to Rs. 8,000/- for gauging the Kalinadi and the Kaneri rivers and taking observations of velocities of these rivers by means of current meter to obtain stage discharge relations was sanctioned by Government under Government Resolution, Public Works Department, No. 8340/36, dated 18th August 1948. The work was entrusted to Messrs. Associated Consulting Engineers(India). In their letter No. ACE/180, dated 31st March 1948 (copy enclosed); the firm informed me that from actual experience gained when the work was carried out, this work would cost Rs. 15,500/-. In their letter No. ACE/180, dated 8th June 1949 (copy enclosed), the firm have now intimated that the cost amounted to Rs. 18,001/-.

The reasons for this increase in cost are :-

(i) The work had taken 12 weeks instead of the originally estimated 4 weeks due to the fact that monsoon rains had failed in the middle of the period and the river level went down at a time when it was hoped that higher readings could be taken.

(ii) The commencement was also delayed as the current meter in question was not cleared from the customs in Bombay.

(iii) The firm had to engage some more labour than was previously estimated.

The work was completed by the firm at the end of August 1948, and their report on these operations was received in November 1948, and is being scrutinised.

Regarding the reference made in their letter No. ACE/180, dated 8th June 1949, to the cost amounting to Rs. 118/- on account of living expenses of Mr. Rama Rao (the Junior Engineer of this Department who was deputed to work with the firm on these observations), Government has been separately approached for the necessary sanction to pay Mr. Rama Rao the increased daily allowance for the full period. On receipt of this sanction from Government, Messrs. Associated Consulting Engineers(India) will be reimbursed to this extent. Therefore, the net cost of this estimate payable to Associated Consulting Engineers (India), would be Rs. 17,883/-.

6. To collect further data in regard to the scheme, it has been found necessary to continue departmentally these river gauging

operations.....

operations. The estimated expenditure on the following works is, therefore included :-

(a) One gauge clerk has been engaged to record the gauge readings on the Kaneri river at the Gund Causeway for 4 monsoon months of the year commencing from June 1948. The cost of this works upto Rs. 830/-, for a period of two years, including maintenance and other charges.

(b) The Depot Officer, Dandeli, has been asked to take gauge readings at Dandeli ~~on the Kalinadi~~ on the Kalinadi river at Rs. 3/- per mensem. The estimated cost for this for two years is Rs. 72. Therefore, the total estimate for river gauging operations is Rs. 902/-.

7. A revised estimate amounting to Rs. 2,28,900/- showing all the above items is enclosed herewith and I request that Goverment may please be moved to sanction this estimate as early as possible, so that amounts due to Messrs. Associated Consulting Engineers (India) for works already done may be paid early.

8. With reference to further detailed investigations for the Supa ~~power~~ power station part of the Kalinadi Scheme (vide paragraph 2 of letter No. ACE/113/190/180, of 2nd April 1949 referred to in paragraph 4 above), I shall separately write to Government in continuation of my letter No. Elg.12-D/3855, dated 7th March 1949 (paragraph 6) referred to in paragraph 1 above."

RESOLUTION:- The revised estimate, amounting to Rs. 2,28,900 for the preliminary investigations and report of the Kalinadi Hydro-Electric Project is approved.

2. Expenditure on the investigations is authorised during the current year under the head "81-A-Capital Outlay on Electricity Schemes". The Electrical Commissioner should report early in January 1950 the actual X amount required during the year, when a source to meet the expenditure will be pointed out.

By order of the Gov ernor of Bombay,

(K.V.Joglekar),
Deputy Secretary to Government.

G.R. No. 8340/36, P.W.D., dated the 28th November 1949.

To

The Finance Department.
The Commissioner, Southern Division.
The Electrical Commissioner with the Government of Bombay (with the estimate).
The Superintending Engineer, Southern Circle.
The Electrical Engineer to Government.
The Accountant General, Bombay (through the Finance Department).

No. of 1949.

Copy forwarded for information and guidance to -

X Funds allotted in file P 317/7 19567 of 1950.

issued with esti 15/12

Finance Department and Gen

Dr.B.K.Ram Prasad,
M.A.(Hons),D.Sc.,
M.I.E.E.,M.Am.,
I.E.E.,M.I.E.(India).

D.O.No. H-7-2/22175
Electric Grid Offices,
Foreshore Road,
Bombay 1: 24th December 1949.

Dear Mr. Joglekar,

With reference to my telephone conversation with you on 12th inst. I give below details regarding the estimate and payments to be made to M/s Associated Consulting Engineers(India) on account of Investigations for the Kalinadi Hydro Electric Project.

The original estimate for the work consisted of the following :-

(i)	Aerial surveys.	Rs. 15, 000
(ii)	Trial Pits & Bores.	" 45, 000
& (iii)	Payments to the Consulting Engineers. (Maximum).	"1,05, 000
	Total.	Rs.1,65,000

The revised estimate as submitted to the Government under this Office Letter No.ELG-12/A/12507 dated 29/7/1949 comprised of the following items.

(1)	The cost of aerial survey in connection with the investigations as now recommended is Rs.20, 234 (Rupees twenty thousand and two-hundred and thirtyfour only.)	Rs. 20, 234
(2)	The cost of percussion drilling and core boring is Rs.44,774 (Rupees fourtyfour thousand seven hundred and seventy four only.)	44, 774
(3)	The revised cost of work as now recommended for the preliminary investigation work and report on Kalinadi hydroelectric project is	

P.T.O.

		Rs.
	Rs.145,064(Rupees one lakh forty-five thousand and sixtyfour only).	1, 45, 064
(4)	The revised cost of work as now recommended for gauging the Kalinadi and Kaneri rivers and taking observations of velocities of rivers by current meter for obtaining stage discharge relations during monsoon of 1948 is Rs.17,883/- (Rupees seventeen thousand eight hundred eightythree only).	17, 883
(5)	Expenses for collection of gauge observations of the Kalinadi and Kaneri rivers as given in detail separately is Rs.902/- (Rupees ninehundred and two only.).	902
	Total Rs.	2, 28, 857
	Rounded to Rs.	2, 28, 900

Of these, item No.(1) pertains to the aerial survey carried out by the survey Department, Government of India and payment is to be made by book adjustment. The survey Department from whom the debit is awaited has been requested to expedite the same.

Item No.(2) is the cost of boring work carried out by M/s Alladin Virji Nathani whom M/s Associated Consulting Engineers(India), engaged as sub-contractors for the work. The Bills have already been paid to Messrs. Associated Consulting Engineers, for payment to M/s Alladin Virji Nathani.

Items Nos.(3) and (4) are the actuals to be paid to M/s Associated Consulting Engineers (India) for their work and report on the preliminary

investigations for the Kalinadi Project and the river gauging of the Kalinadi and the Kaneri River in connection therewith, respectively.

For the work at item (4) the firm had originally estimated Rs.8000/- as their charges and later revised it to the actuals of Rs.17,883/-. The original estimate of Rs.8000/- was ~~also~~ sanctioned by the Government.

Item No.(5) pertains to the estimate for making gauge observations of Kalinadi and Kaneri Rivers. This work is being carried out departmentally through the Divisional Forest Office both at Dandeli on the Kalinadi River and the Gund Causeway on the Kaneri River.

Against item (3) ~~this~~ an amount of Rs.1,05,254 has been paid to the firm. A balance of Rs. 39,810 towards item (3) and Rs.17,883/- towards item (4) are yet to be paid.

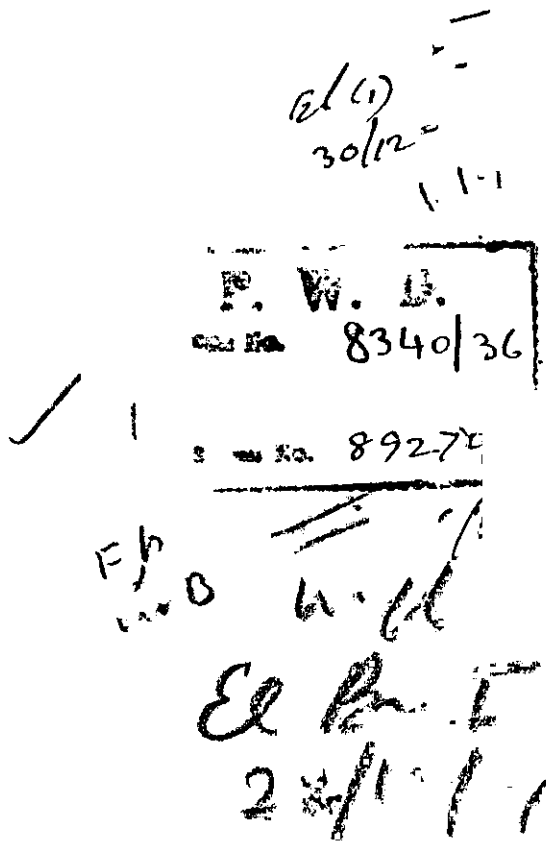
As the firm is pressing for payment of their balance I request early sanction for these estimates, may be communicated

Yours sincerely,
B K R Prasad
15/12

K.V.Joglekar, Esqr.,
Deputy Secretary to Government,
Public Works Department,
BOMBAY.

I think orders have been already issued
Kkg 18/12/69

Rly Bd (I)


P. W. D.
8340/36
89275

El. Br. II. P. W. D.

The presumption made by the Dy. Secy. is correct. Secy. G.R. was issued on the 13-12-49. Since, however, Dr. Ramprasad's d.o. within is dated the 29-12-49, a copy of the G.R. may be sent to him as per draft put up, if appd.

ABB.
12-1-50.

KJ 13/1/50

12

DS.

8340/36/89274

D.O. No. 8340/36-El-I,

P. W. D. Sec H.
Bbay No. 1.
Jan. 1950.

Dear Sir,

Reference your D.O. No. H-7-2/22175, 1-69
dated 29th December 1949. In this con., please refer to G.R. No. 8340/36, 1-1-65-67 d. the 13-12-49 (copy enclosed), in which necy. orders in the matter have already been issued.

x at the committee

Yours Sincerely,

To
Dr. B.K. Ram Prasad,
M.A.(Hons), D.Sc., M.I.E.E.,
M. Am. I. E.E., M.I.E.(India).
Superintending Engineer (Hydro.)
El. Guid Offices, Foreshore Road,
Bombay.

NB
121-50

K Jn 3/1/50

DS.

E.S.E.
14/1/50

Accompaniment
Sent Separately

A NOTE

ON THE INSTALLATIONS NEEDED FOR THE COLLECTION OF HYDROLOGICAL DATA FOR THE KALINADI HYDRO ELECTRIC SCHEME.

*****

The following are the installations needed for the collection of rain-fall and water discharge data :-

(a) Self recording Rain-Gauge:- This will be installed near an ordinary rain-gauge, so that the two can be compared. The self-recording rain-gauges recently obtained from the Meteorological Department are not still functioning satisfactorily, and unless checked by an ordinary rain-gauge, the readings will not be reliable. Till we get more reliable self-recording rain-gauges, we have to use both kinds of rain-gauges for each rain-gauge station.

By means of self-recording rain-gauges, it is proposed to obtain, three hourly, and six hourly correlation of rain-fall data, and work out probable rain pattern and obtain the peak discharges.

(b) Ordinary rain-gauges:- These will be installed in several places within the catchment area, so as to obtain an average rain-fall pattern in the catchment. After a few years of study of the correlation between the various rain-gauge stations amongst themselves and with the self-recording rain-gauges, it may be possible to remove some of the ordinary rain-gauges, since from these studies, the rain pattern for the whole catchment area could afterwards be obtained by a few selected observations only.

(c) River Gauges:- These serve two purposes viz. correlating the river discharge to the gauge height, and secondly to correlate the time log between the rainfall in the catchment and the arrival of the flood at the gauge site.

(d) River Discharges:- These are very important data, required to calculate the total run-off as well as peak flood height at various sites. These are usually located at places which control the river discharge from the contributing schem

All such sites will be fitted with river gauges.

The locations of the proposed installations in the various catchments for Kalinadi Scheme are given in the attached Statement I.

2. The sites will have to be inspected in detail before installation of the gauges and may have to be altered to suit local conditions.

3. It is proposed to open a temporary Kalinadi Sub-Division in April 1950, so that the Sub-Divisional Officer with head-quarters at Supa, may supervise the erection of the gauges at various sites and later on look after the observations. He will analyse the readings and observations as may be obtained from day to day, from the next monsoon, in order to assess the correctness and correlation between the various observations.

An estimate based on the above proposals for the various installations as in Station No. II including the staff requirements for erection work for six months and observations for five years, is enclosed.

******

I

Statement of installations.

***

I. Supa Catchment:-

(1) Self recording and ordinary rain gauges -

(a) Chandúddi

(b) Castle rock

(c) Tmái Ghat Station

(d) Populwaddo

(2) Ordinary rain gauges -

(a) Supa dam-site

(b) Aketidueagalli

(c) Londa

(d) Jugglepett

(e) Soliya

(f) Coonkeeray

(g) Kumbarwadi

(3) River Gauges -

(a) Pandri river up-stream of its junction with Kalinadi.

(b) Kalinadi up-stream of its junction with Pandri river.

The above river gauges will be placed at such sites as are above the influence of the back water from the floods in the adjoining river.

(4) River discharge stations:-

(a) Supa dam-site.

II. Kaneri Catchment Area:-

(1) Self recording and ordinary gauges:-

(a) Coondol.

(2) Ordinary rain gauges:-

(a) Kalsye

(b) Dam-site near Gund.

(3) River discharge stations:-

(a) Dam-site near Gund.

III. Bomanhalli Pick up weir catchment:-

(1) Self recording and ordinary gauges:-

(a) Bomanhalli.

(2).....

(2) Ordinary rain-gauges:-

(a) Pagoda.

(3) River discharge stations:-

(a) Bomanhalli.

IV. Lower Kalinadi Catchment:-

(1) Self recording and ordinary gauges:-

(a) Haliyal

(b) Dam-site.

(2) Ordinary rain-gauges:-

(a) Naglaye

(b) Kukenhatti

(c) Khandrankop.

(d) Junjanbail

(e) Inspection Bungalow near Khandrankop

(f) Junction of Kalinadi and Kaneri

(g) Chapoli

(3) River Gauges:-

(a) Kaneri (above junction with Kalinadi)

(b) Kalinadi (above junction with Kaneri)

(4) River discharge stations:-

(a) Dam site

(b) Inspection Bungalow near Khandrankop

The above sites have been marked in the drawing No. Misc.80 of the Kalinadi Hydro-electric Scheme enclosed herewith.

*****

STATEMENT - II.

HYDROLOGICAL OBSERVATIONS FOR KALINADI SCHEME.

Statement of Installations and staff for observations

No.	Location	INSTALLATIONS				STAFF						REMARKS.
		Self & ordinary Rain Gauge Stn.	Ordinary Rain Gauge Station	River gauging station.	River discharge station	A.E. Nos.	J.E. Nos.	Recorders Nos.	Khalasis Nos.	Watchmen Nos.	Clerks Nos.	
1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Supa Catchment:-											Staff for various installations.
	(i)(a) Chanduddi	1	-	-	-	-	1	1	-	1		(1) Self-recording rain-gauge.
	(b) Supa Dam site	-	1*	-	1	1	3 (0+2 +1)	2	5 (4+1)	3 (1+1 +1)	2	(2) Ordinary rain-gauge.
	(ii)(a) Aketiduoegalli.	-	1	-	-	-	-	1	-	1		(3) River gauging station.
	(b) Londa	-	1	-	-	-	-	1	-	1		(4) River Discharge station
	(c) Jugglepett	-	1	-	-	-	-	1	-	1		
	(d) Soliya	-	1	-	-	-	-	1	-	1		
	(e) Coorkeeray	-	1	-	-	-	-	1	-	1		
	(f) Kumberwadi	-	1	-	-	-	-	1	-	1		
	iii(a) Pandri River.	-	-	1	-	-	-	1	-	1		

	J.E.	R.	K.	W.
(1) Self-recording rain-gauge.	1	1	-	1
(2) Ordinary rain-gauge.	-	1	-	1
(3) River gauging station.	-	1	-	1
(4) River Discharge station	2	2	4	1

Staff for A.E.'s Office.

1 - Junior Engineer
1 - Khalasi
1 - Watchman
2 - Clerks.

1	2	3	4	5	6	7	8	9	10	11	12	13
	(b)Kalinadi	-	-	1	-	-	-	1	-	1		
	(iv)(a) Castle Rock	1	-	-	-	-	1	1	-	1		
	(b) Tmai St. (c) Populwaddo.											
2.	Kaneri Catchment Area:-											
	(i) Coondol	1	-	-	-	-	1	1	-	1		
	(ii)(a) Kalsye	-	1	-	-	-	-	1	-	1		
	(b)Dam site near Gund	-	1	-	1	-	2 (0+2)	2	4	2 (1+1)		
3.	Bomanhalli Pick-up weir Catchment:-											
	(i) Bomanhalli	1	-	-	1	-	2	2	4	2 (1+1)		
	(ii) Pagoda	-	1	-	-	-	-	1	-	1		
	Lower Kalinadi Catchment:											
	(i)(a) Haliyal	1	-	-	-	-	1	1	-	1		
	(b) Dam site	1	-	-	1	-	2	2	4	2 (1+1)		
	(ii) (a) Naglaye	-	1	-	-	-	-	1	-	1		
	(b) Kukenhatti	-	1	-	-	-	-	1	-	1		
	(c) Hulkop	-	1	-	-	-	-	1	-	1		
	(d) Junjanbail	-	1	-	-	-	-	1	-	1		

* An estimate for installing self-recording rain gauge at Supa dam sit is sanctioned (vide P.W.D. No. 229/61567 I.B.(I) dated 3.10.1949 and therefore only ordinary raingauge is proposed.

NOTE:- At the following places the staff has been reduced, as mo than one installation are located at one places.

Places:- 1(i)(b); 2(ii)(b); 3(i); and 4(i)(b).

2	3	4	5	6	Staff 7	8	9	10	11	12
(e) I.B. near Khandrankop	-	1	-	1	-	2	2	4	2	
(f) Junction of Kalinadi and Kaneri River	-	1	-	-	-	-	1	-	1	
(g) Chapoli	-	1	-	-	-	-	1	-	1	
(iii)(a) Kaneri (above Junction)	-	-	1	-	-	-	1	-	1	
(b) Kalinadi (above junction)	-	-	1	-	-	-	1	-	1	
TOTAL:	8	17	4	5	1	17	34	21	35	2

KALINADI HYDRO ELECTRIC SCHEME.

HYDROLOGICAL OBSERVATIONS.

ABSTRACT.

		Rs
I.	Works	2,36,110
II.	Tools and Plant	76,660
III.	Establishment	2,18,050
		5,30,820
	Head-quarter charges @ 3½%	18,477
		5,49,297
	SAY Rs	5,49,000

MTB/9.3

5,49,000
2,18,050
3,31,950

I - WORKS.

(1)	8 Self-recording and ordinary rain-gauge stations at Rs 590/- each (as per sub-estimate 1).	4,720
(2)	17 Ordinary raingauge stations @ Rs 550/- each (As per sub-estimate 2).	9,350
(3)	4 River gauging stations @ Rs 2520/- each (As per sub-estimate 3).	10,080
(4)	5 River discharge stations @ Rs 4320/- each (As per sub-estimate 4)	21,600
(5)	Floats, bottles, boxes, etc. for velocity observations - collection of water samples, packing, despatching, Railway fare etc. for five years.	5,000
(6)	Maintenance to rain & river gauges for 5 years.	10,000
(7)	Salaries of maistries and Khalasis during construction period. (As per sub-estimate 5).	7,320
(8)	Recorders @ Rs 2/8/- per day for 150 days per year.	
	36 for 4 years. Rs 51,000)	
	24 for 1st year. 9,000)	60,000
(9)	21 Khalasis at Rs 2/- per day for 150 days per year for 5 years.	31,500
(10)	Watchmen @ Rs 2/- per day for 150 days.	
	35 for 4 years Rs 42,000)	
	21 for 1st year 6,300)	48,300
(11)	Local arrangement for observations of rain gauges etc. in remaining 215 days for 5 years.	17,000
	Total Rs	2,24,870
	Contingencies @ 5%	11,240
	TOTAL (Works) Rs	2,36,110

MTB/9.3

II - TOOLS AND PLANT.

	Rs	Rs
(1) Self Recording Rain gauge Station.		
(a) Self recording rain gauge	350	
(b) Time piece	30	
	380	
For 8 Self-recording rain gauge Stations.		3,040
(2) Ordinary Rain-gauge stations:		
(a) Rain-gauge (Indian Make)	100	
(b) Funnel, measuring jars etc.	50	
(c) Time piece	30	
	180	
For 17 ordinary rain gauge stations		3,060
(3) River gauging station:-		
(a) River gauge recorder	2,750	
(b) Time piece	30	
	2,780	
For 4 river gauging station		11,120
(4) River discharge station:-		
(a) River gauge recorder	2,750	
(b) Stop watches 2 for each	200	
(c) Time piece	30	
(d) Sextant	750	
(e) Current meter wire etc.	1,800	
(f) Boat	500	
(g) Wire rope, cradle etc.	3,000	
	9,030	
For 5 River discharge stations		45,150
(5) Sub-division tools (L.S.)		4,000
(6) Transport charges @ 10%		6,640
		73,010
(7) Contingencies @ 5%		3,650
TOTAL (T. & P.) Rs		76,660

III - ESTABLISHMENT.

1)	Construction Staff for Construction (As per Sub-estimate).	Rs.	11,665
2)	Maintenance and Observations :-		
	a) Staff for maintenance and observations for 5 years : (from June to October - every year). (As per Sub-estimate 7).	Rs.	1,80,995
	b) Equipment for staff for 5 years	Rs.	15,000
		Rs.	2,07,660
	Contingencies @ 5%	Rs.	10,383
		Rs.	2,18,043
	Total (Establishment) Say	Rs.	2,18,050.

KRN/9.3.

SUB-ESTIMATE 1.

Estimate of Works for the Installation of a Self Rain Gauge Station.

		Rs.
1.	Cutting jungle, clearing and levelling.	100
2.	Excavation for Foundations.	5
3.	Filling in rubble and earth.	32
4.	Providing and fixing cut jungle wood for fencing.	306
5.	Providing and fixing jungle wood for Gates.	30
6.	Providing concrete pillars 18" diam., 2' below ground level and 11" above ground level.	25
7.	Land	50
8.	One year's supply of Charts	36
	Rs.	584
	Say Rs.	590/-

****

SUB-ESTIMATE 2.

Estimate of Works for the Installation of an Ordinary Rain Gauge Station.

1.	Civil Works (Same as for self recording Station, less item No. 8).	Rs.	548
		Say Rs.	550/-

KRN/9.3.

SUB-ESTIMATE 3.

Estimate of Works for the Installation of a River Gauging Station:

	Rs.
1. Labour for clearing jungle and Survey of Cross-section etc.	200
2. Supplying gauge plates and erecting them on T.W.Posts at site.	2,320
Total Rs.	2,520/-

****

SUB-ESTIMATE 4.

Estimate of Works for River Discharge Site.

	Rs.
1. River gauging Works (same as for item 2 of the river gauging station.).	2,320
2. Erecting, wire rope on T.W. trestle etc. to take up cradle arrangement.	2,000
Rs.	4,320/-

KRN/9.3.

SUB-ESTIMATE NO. 5.

Salaries of Maistries and Khalasies during Construction Period (Works).

1. 6 Maistries for 6 months (2 months @ Rs. 130/- P.M. (exclusive of Dad climate allowance) and 4 months @ Rs. 150/- P.M. (inclusive of bad climate allowance)	5,160
2. 6 Khalasis @ Rs. 60/- P.M. for 6 months.	2,160
Rs.	7,320/-

SUB-ESTIMATE NO. 6

Construction Staff

(for first year only)

		Rs.
1.	1 Assistant Engineer for 6 months @ Rs. * 620/- P.M.	3,720
2.	2 Junior Engineers for 6 months (2 months @ Rs. * 260/- P.M. (exclusive of bad climate allowance) and 4 months @ Rs. * 290/- P.M. (inclusive of bad climate allowance).	5,040
3.	2 Clerks for 6 months @ Rs. * 135/- P.M.	1,620
4.	Provident Fund (for Staff in items 1,2, and 3.).	445
5.	Travelling Allowance (3 Junior Engineers to and return; and 1 Assistant Engineer single journey).	840
	Rs.	11,665/-

* This is average salary plus allowances.

NOTE 1.

No.	Designation	Average Basis Salary Say Rs.	D.A. Rs.	P.T.A. Rs.	Bad climate allowance.	Total P.M. Rs.
1.	Assistant Engineer.	400	70	150	-	620/-
2.	Junior Engineer	200	60		30	290/-
3.	Sub-Overseer.	105	50		25	180/-
4.	Clerk	90	45		-	135/-
5.	Maistry	805	45		20	150/-
6.	Karkun	64	35		20	119/-
7.	Mukadam	45	35		15	95/-

NOTE NO. 2. The staff will be employed as may be available.

KRN/9.3.

SUB-ESTIMATE NO. 7.

(Abstract) (Establishment).

Maintenance Staff for 5 Years.:-	Rs.
Salaries etc. for 1st Year.	29,935
" " " 2nd "	37,765
" " " 3rd "	37,765
" " " 4th "	37,765
" " " 5th "	37,765
Rs.	1,80,995.

*****

SUB-ESTIMATE 7 (Working sheet 1).

Salaries etc. (for first year only).

	Rs.
1. Salaries	
a) 1 Assistant Engineer for 1 month @ Rs. 620/- P.M.	620
b) 15 Junior Engineers for 5 months @ Rs. 290/- P.M. each.	21,750
c) 2 Clerks @ Rs. 135/- P.M. for one month.	270
2. Provident Fund (for Staff in 1,(a), (b) and (c)).	975
3. Travelling Allowance (15 Junior Engineers to and return fare; 1 Assistant Engineer single journey fare).	3,720
4. Rent for office building @ Rs. 50/- P.M. for 12 months.	600
5. Office Contingencies	2,000
Rs.	29,935/-

(Continued)

2,07,000
41,600
1,65,400

29,935
11,665
41,600

SUB-ESTIMATE NO. 7. (Working Sheet 2).

Salaries etc. for subsequent 4 years.
(Abstract)---(Establishment).

(Annual).

	Rs.
1. Salaries :-	
a) 1 Assistant Engineer for 5 months @ Rs. 620/- P.M.	3,100
b) 17 Junior Engineers for 6 months @ Rs. 290/- P.M.	24,650
c) 2 Clerks @ Rs. 135/- P.M. for 5 months.	1,350
2. Provident Fund (For Staff in Items 1) (a), (b) and (c))	1,245
3. Travelling Allowance (1 Assistant Engineer and 17 Junior Engineers to and return fare).	4,320
4. Rent for Office building @ Rs. 50/- P.M. for 12 months	600
5. Office Contingencies	2,500
Total Rs.	37,765/-

****

KRN/9.3.

VERY URGENT
Letter

No. H 7-3/3601
Electric Grid Offices,
Foreshore Road,
Bombay 1: 15 March 1950.

The Secretary to Government,
Public Works Department,
Bombay.

Subject: Kalinadi Hydro Electric Project - Hydrological observations in connection with -
Reference: This office letter No. H-7/3/11849, dated 16th/18th July 1949.

As Government is already aware, the preliminary investigations on the Kalinadi scheme were carried out by Messrs. Associated Consulting Engineers (India), Bombay, and their report has been submitted to Government, vide this office letter No. Elg.120/3855, dated the 7th March 1949. Government had also approved of my proposal of taking up the detailed survey and exploratory work, leading up to and preparation of the project report for the Supa dam which is a part of the Kalinadi scheme, vide Government letter, Public Works Department, No. 8340/36-EL, dated 1-6-1949. Since this sanction of Government, it has, however, been indicated to me that the submission to Government of the detailed estimates for this investigational work may be held up till about June next. Obviously, no work on survey can be taken up till the estimates have been submitted to and approved by Government. Meanwhile, however, it is necessary to take immediate decision on the question of collection of hydrologic data.

2 For the correct design of such a hydro electric project, it is essential that hydrological data for a large number of years should be collected. It has, for example, been found on the Koyna investigations that last year's detailed monsoon data was the most important for our investigations and without this data, our hydrological studies would not have been useful to any satisfactory degree. It is, therefore, essential that we should start collection of hydrological data in the whole of the Kalinadi basin from the coming monsoon and to continue the same till such time as the project is taken in hand or for at least a period of 5 to

10 years whichever is earlier. I have intentionally mentioned the whole Kalinadi basin because the full project consists of a number of ancillary projects interlinked with each other and the collection of the data in the whole basin is an absolute necessity for correlation and proper study of any one of them.

In this connection, I had suggested last year the undertaking of this work, but as the sanction was not received in time it was not possible to make a beginning, vide please my letter No. H-7-3/11849, dated the 16th/18th July 1949, to Government.

3. It is now proposed to undertake this work and for this purpose, it is suggested that a subdivision be opened for organising the necessary hydrological observations; utility of various types of observations is mentioned in the enclosed note. I also attach a statement showing various installations which would be required for the whole Kalinadi basin.

4. The cost of these observations for a period of 5 years is estimated to be Rs. 5,49,000/- as per the estimate attached. I request very early sanction of Government to this estimate so that the necessary steps may be taken to appoint the staff to undertake the installation of the various gauges and start taking observations during the coming monsoon. To make this possible, it will also be necessary for Government to ensure the appointment of a full subdivision in time.

As a lot of time would be needed for setting up of the organisation, fixing installations, etc., I shall be grateful for orders of Government in this behalf by the first week of the next month (April).

P. Bhadram.

Electrical Commissioner
with the Government of Bombay.

Encls:

ARK.10.3.50.

W. D.
834 0/31
20769

8340/36/20769

P.W.D.

El. Br. (I)

Submitted with reference to the office note dated the 5th Septr. 1949 at pages 55 to 57.

2/- The Electrical Commissioner, has now submitted a fresh proposal of collecting hydrological data in the whole of the Kalinadi basin. In this connection attention is invited to the Electrical Commr. letter Nos H7-3/7806 dated 12-5-49 and H.7-3/11849 dated 16/18-7-49. The work could not be started last year as the monsoon had already set in & no orders were issued then. The proposal was also then withdrawn by the E.

3/- The E.C. now proposes to collect hydrological data in the whole of the Kalinadi basin, from the coming monsoon & to continue the same till such time as the project is taken in hand or for at least for a period of 5 to 10 years whichever is earlier. The E.C., has proposed the collection of data of the whole of the Kalinadi basin, as the full project consists of a number of ancillary projects interlinked with each other and the collection of data

in the whole basin is an absolute necessity for correlation and proper study of each river.

4/- The E.C. has submitted the proposal has stated that the cost of these observations amounts to Rs. 5,49,000. The details of the total cost of Rs. 5,49,000 are as given below:-

(1) Work ------ Rs. 2,36,110 } b-93
(2) Tools & Plant --- Rs. 76,660 }
(3) Establishment --- Rs 2,18,050 }
Total Rs 5,30,820

Add Head quarter charges at 3½% Rs (18,477) / 18599
Grand Total Rs 5,49,297. 549399
or say Rs 5,49000.

The details of the proposed expenditure on the various sub heads will be seen at pages 95 to 99. The E.C. has also submitted pp 101 to 111 the various 7 sub estimates for the installation of various rain gauge stations. He proposes that a sub division may be opened for organising the necessary hydrological observations and requests that sanction to the estimate may be accorded early so that action would be taken to appoint the staff to undertake the installation of various gauges and start taking observations during the coming monsoon. As much

time

time would be required for setting up the organisation, fixing installations etc. Govt. orders have been received very early.

5/- If the E.C's proposal is considered feasible and the proposed scheme amounting to Rs. 5,49,000 is found to be in order, the papers may be referred W.O. to the R.C.D. and F.D. for remarks before according approval to the E.C's proposal.

AB(II)
Through ~~AB(II)~~, E.B (I), E.B (II) & D.E(S)

8/12/4/50.

6. No provision has been made in the current year's budget for the Kalimadi Hydro Electric scheme Survey. A new item for the Kalimadi Supa Project investigation, which is a part of the whole scheme, was put up for the budget of 1950-51 but was not admitted. In the circumstances, it is for consideration whether expn. may be authorised in the current year.

19-4-50

The estimate provides for 8 self recording & 17 ordinary rain gauge stations, 4 river gauging stations & 5 River discharge stations. The estimate is in order.

20/4/50

As the collection of hydrological data over a sufficiently long period is a very important pre-requisite for the ~~Correct~~ accurate framing of the designs, ~~and price~~ the necessity of this work may be accepted and the Elec Comm may be authorised to undertake this work, in c.o. consultation with the F.D.

Hf 21/6/50

I agree.

As per page 119

JJ
22/6.

119

Very Urgent.

D.O.

Public Works Department,
Secretariat,
Bombay No. 1, 1st May 1950.

Dear

I have requested the Overseer attached to your office (as you were on tour), on telephone, last Monday or so, to supply me a list and plan showing the places where your Division has already fixed the rain gauges and the river gauging sites or propose to fix them in the near future, in the Kali-nadi valley (North Kanara District). I have however not so far received this information. Will you kindly look into this and send me the required information by the return post if it has not been already despatched?

Yours

1/5/50

(K. V. Joglekar)

Shri D.R.Bhalerao, B.E.
Executive Engineer,
Water Resources Investigation Division,
Poona 1.

ISSUED
1/5/50 4883

BVK.
1.5.50.

D.O.No.71 14

Office of the
Executive Engineer,
Water Resources Investigation
Division, Poona 1950.

Dear Shri Joglekar.

Reference your D.O.dated the 1st May 1950.

2. The requisite list and plan was sent to the Secretariat under my No.DB/B/15 dated the 26th April 1950 from Belgaum where I was camping then.

3. I enclose, however, a spare copy of the plan and list along with a copy of letter for ready reference.

Yours sincerely

O R Shelkar
3/5/50.

Shri K.V.Joglekar,
Deputy Secretary to
the Government of Bombay,
Public Works Department,
Bombay No.1.

No.DB/B/15 of 1950.
Poona 1: 26-4-1950.

To

The Deputy Secretary to Government,
Public Works Department, Bombay.

Subject :- Kalinadi Valley -
Existing rivergauges
and raingauges in -

With reference to your telephonic talk on 24th April 1950 I am sending herewith a blueprint plan and a statement showing the existing raingauges in the Kalinadi valley. Out of these raingauges, the raingauges at S.Nos.1 to 4 were fixed before the monsoon of 1949 and as such the rainfall data for them is available for the monsoon of 1949. The daily rainfall figures for these four stations will be supplied, if required.

2. There are no existing rivergauges in this valley but I may add for your information that one rivergauge at Sulia has been proposed to be fixed on Kalinadi during the year 1950-51. The observations of river discharges at this site will be take from 1951-52.

Sd/- D.R.Bhalerao
Executive Engineer,
Water Resources Investigation Divn.

f/3/-

Statement showing existing Rain Gauges in the Kali-Nadi Valley.

1) Chandavadi on Pandhari River (Tributary of Kali-Nadi).
2) Jugalbet " " " " "
3) Castle Rock " " " " "
4) Londha " " " " "
5) Bhagavati On Kali Nadi.
6) Dhodkop " "
7) Kirvatti " "
8) Kukumhatti " "
9) Kheda " "
10) Pali " "
11) Kumbharwada " "
12) Rampur " "
13) Gund " "
14) Kalsai on Kaweri (Tributary of Kalnadi)
15) Kundal " " "
16) Aketidudegeli on Pandhari " "
17) Kalpa " Kalinadi
18) Sulia " "

.....

Typed: S/25/4
Compd: ✓

P.W.D

129

Vide pencil notes recorded on H 118-119

As personally discussed, I have obtained the details of the rain-gauges and river gauges which the Ex. Engr., Water Resources Investigation Division, has already installed or proposed to install in the Kalinadi basin. It is seen from these details that four rain-gauges were fixed before the monsoon of 1949 at -

Chandvadi,
Jugalbet,
Castlerock,
and Londa.

Rain-gauges at 14 other places mentioned in the list at p. 125 are yet to be fixed. It is also proposed to fix one river-gauge site at Sulia in the current year.

The Elec. Commr. has proposed to install rain-gauges at 25 places, many of which coincide with those proposed by the Ex. Engr., W.R.I.D. In order, therefore, to avoid duplication of work under two separate organizations, it would be desirable to entrust the entire work of observing rainfall and river discharges in the Kalinadi basin to the Ex. Engr., W.R.I.D. If this is approved, that Officer may be supplied with the details of the 'observations' which the Elec. Commr. has suggested and asked to submit the necessary estimates for approval and sanction of funds. He will of course exclude such of the items which have been ~~already~~ provided for, in his own programme already sanctioned

DRN.
4.5.50.

KJ 4/5/50

I agree. I presume the Elec Comr would have no objn.

Secy

4/5

8340/3-
20769

Pl. Br (I)

PWD.

Resubmitted.

2. The parties may first be ref
no. in the Regd. corresp. with reference
to the secy's presumption overleaf.

<21
5/5/10

KJ 6/5/10

15 5
11 0

+ no. in Pl. comm, & 8-5-50

+ with file no 8340/36

Below P.W.D. U.O.R. No. 8340/36/20769 dated 6.5.1950.

****

ELECTRIC GRID OFFICES.

SUBJECT :- Kalinadi Hydro Electric Project- Hydrological observations in connection with -

The raingauge observations being usually taken by the Water Resources Investigation Division are limi to about once or at the most twice in 24 hours, more probably the former. For the purposes of correct ment of the rainfall, runoff data in a high utili hydro project, we need much more detailed observa For example, we have to not only observe the tota hourly or annual rainfall but also to collect dat regarding the hourly and three-hourly figures in to arrive at the figures at the peak discharge fr any catchment. Similarly our runoff observations to be taken almost round the clock so that the ti lag between the rainfall and runoff may be ascert

For the observations of the figures we ha install not only the ordinary raingauges, but sel recording types as well. Similarly, if possible, would like to install self-recording depth gauges the river at various sites.

2. The raingauge stations fixed by the Resources Investigation Division are common As the monsoon is almost on us, it will not for this Department now to set up any organi the hydrological observations. Therefore, th Resources Division may observe these raingau usual and if possible atleast twice a day. A raingauges are not self-recording it will nc possible for them to record three-hourly rai figures but the data that may be collected c is also likely to prove useful.

As regards the discharge station at Sulia, it is seen to be at the source of a tributory of the Kalinadi river. It is not known with what purpose this raingauge is being fixed because for the investigations of the Kalinadi basin the river-gauges to be fixed have already been specified by me in my previous letter. This particular river gauging station is, therefore, hardly likely to be useful to this Departme except perhaps to assess the maximum runoff possible from a very heavy rainfall area.

3. Up to the present time the hydrological data, being observed in the normal course in this State, can be made use of only in a general way and for projects where the utlisation may not be very high. For Hydro projects the utlisation will be as much about 90% and ch more accurate data is necessary. Also till such me as a proper plan of utilisation of the resources the various valleys is made, it will be difficult ensive to insist on intensive observations of gical data over the whole area. Therefore, ne present Water Resources Division may be useful lecting the general data, it is essential that a project more intensive observations should be out, to the extent depending on the nature of ject in view.

The Kalinadi Project being a hydro-electric h more intensive data is necessary and therefore, e collected by the specialised Department which de the extent and requirements of such data.

In view of these factors, I feel that the on of the intensive data in the Kalinadi basin e done by the Electric Grid Department which ow what data and how intensively it should be d. It is also fair that the expenses of the

collection....

collection of such specialised data should be a charge to the project concerned and not to the general revenues of the State.

This matter has been discussed by Shri Anand, Superintending Engineer (Civil) with the Secretary, Public Works Department and was explained in respect of the necessary technicalities. I would, therefore, request you please to move Government to sanction estimates already submitted and authorise collection of data which will now have to be started in 1951. Preliminary arrangements for instruments and staff usually take a long time and therefore, I will have to start making the same from the end of the current monsoon. In the meanwhile and for the coming monsoon the Water Resources Division should collect the data for the four raingauge stations which ~~he~~ it has already installed. These raingauge stations will be taken over by the Electric Grid Department after this monsoon and will be supplemented by additional ones as necessary.

PMA.

24/5/50.

Secretary to Government,
Public Works Department,
Bombay.

EIRD-2615

U.O.R. No. TC/ 11392

Bombay 1: dated 24 May 1950.

8340/36

Serial No 42089

EIRD

Copy to -

Superintending Engineer (illegible)

Superintending Engineer (illegible).

MTB/23.5

8340/36/4208

El.Br.(I). P.W.D.

Govt. has decided that the detailed survey and exploratory work leading to and preparation of project report of the first stage of Kalanadi development at Supa should be carried out and the El.Commr. has been asked in G.L.No.8340/36-El., d. the 1-6-49, to submit for the approval of Govt; detailed proposals and estimated cost for the proposed work connected with the development of Supa part of the Kalinadi Scheme. The El.Commr's proposals in this con. are expected to be received during the current month.

2. In con. with the above scheme, the El.Commr. considers it essential to collect the hydrological data in the whole of Kalinadi basin by installing several self recording and ordinary rain gauges, river gauges and river discharge station as mentioned on pp. ante. For this purpose, he proposes to open a Sub-Division(vide, para 3 of his letter on pp. 114 ante.) and has submitted for Govt. sanction, an estimate of Rs. 5,49,000 as detailed below, which will be the cost of the hydrological observations for a period of 5 years:-

	Rs.
Works	2,36,110
Tools & plant	76,660
Establishment	2,18,050
Headquarter charges at 3 1/2%.	18,579
Total	5,49,399 -, say Rs. 5,49,000/-

, 3. As many of the rain-gauges proposed to be installed by the El.Commr.(vide pp. 83-85 ante) coincide with those proposed by the Ex.Engr.Water, Recourses Investigation Division(vide, pp. 123-125 ante), the Dy.Secy. state that in order to avoid duplication of work under two separate organizations, the entire work of observing rainfall and river discharges in the Kalinadi ~~Basin~~ Basin should be entrusted to the Ex.Engr., W.R.I.D.-vide, Dy. Secy's note, d. the 4-5-50, agreed to by the Secy. on p. 129 ante.

f/o 131-133

4. For the reasons given in his letter within which, f.133 states the El-Commr., have been explained personally to the Secy. by Shri Anand, S.E.(Civil), the El.Commr. now proposes that -

(a) the Water Resources Division may observe for the present these raingauges as usual and if possible atleast twice a day and collect the general data for the four raingauge stations which it has already installed.

(b) the collection of the intensive data in the Kalinadi basin should be done by the El.Grid Deptt., which would know what data and how intensively it should be collected.

(c) the expenses of the collection of such specialised data should be a charge to the project concerned and not to the general revenues of the State.

(d) The raingauge stations already installed by the W.R.I.Dn. will be taken over by the El. Grid Deptt. after this monsoon and will be supplemented by additional ones as necy.

(e) the estimates of Rs.5,49,000/- f.113 already submitted may be sanctioned and the collection of data, which will now be started in 1951, may be authorised.

5. It is for orders whether the El.Commr's proposals mentioned in the proceeding para may be accepted and the estimate of Rs. 5,49,000(for collecting the hydrological data, at the several raingauge stations to be installed, for which opening of a Sub-Dn. will be necy.) may be approved in u.o. consultation with the R.C.D. and the F.D.

Thro' I.B.(I), E.B.(I)&(II), A.B.(II)& D.E.(I).

LBW/12/6

10-6-50

o—9/36

Received from the Parliamentary Secretary.
today
14/7.

El. Bd. Is.

P. to S.

These papers were sent to the P.S. to the H.M. Agriculture, on the 19-6-50 with the approval of the D.S. They have been recd. to-day without any covering letter or a note from the P.S.

2. Attention is invited to the O.N. on pp. 133-1 ante and orders are solicited on para 5 of the O.N. on p. 135

Thro' EB Is & IIs, AB IIs & DEC Is.

ASO 14-7-50 15

15-7-50

S.O. 15-7-50

DS. Grey no Hqrs 2 TA

3. As regards funds perusal of para 6 of the O.N. dt the 20-4-50 of the F.D. is requested agrees expre. may be authorised in the current year in anticipation of the sanction of the L.A.

Hqrs 19-7-50

4. The estimate is forms in order already. In view of details observations, proposal as in para 5 of ON may be accepted.

19/7/50

Estimate submitted by the Elec Commr may be approved. Portions side-lined 'A' on pp. 131-132 ante, of the Elec Commr's letter may be brought to the notice of the Sec. Govt, Water Resources Investigation Division.

KJ 19/7/50

To be done now before he sees Minister

JJ

Grey

JJ 20/7

4-0 RECD

8340/36. 138

El. Br. I.

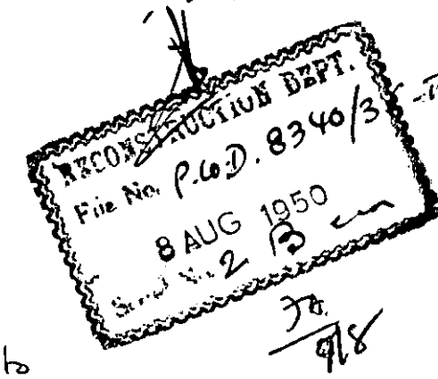
Resubtd. P. W. D.

2 As directed in the Secy's. marginal note overleaf, secy. draft is put up for approval, which may issue first and then the papers be regd. no. to the Regd. and the F.D. as proposed in the O.N. on pgs 135-136 ante.

ASS
26-7-50.

Kpb/7/50 DS.

D. to R.C.D & Fin Dtd 5.8.50



R.C.D.
Seen and passed on to the F.D.

2 This Dept. may not object to the P.W.D. proposal in para. 8 of its note dt. 12.6.50, provided that the expdtr. thereon is accommodated within the ~~sanc~~ amount allocated for scheme No. 1.

F. 136.

J.N.P
9.8.50.

10/8/50

FINANCE DEPARTMENT
P.W.R. I
12-8-50
No. 36112.

W.O.R. to F.D.dt. 11th Aug. 50.

& with file
8340/36

134 8340/36/42089

Letter.

No. 8340/36-El. I.

P. W. D.

B.C. (Bombay No. 1)

15 July 1950.

27

To

The Exc. Engr. Water Resources Investigation Dn. Poona.

Sub :- Kalinadi Hydro-El. Project— Hydrological observations in con. with the ——

Refee :- Your letter No. DB/B/15, d. the 26-4-1950. †123

2. A copy of the Se. O. L. No. TC/11392, d. the 24-5-1950, from the El. Commr. with the G. of B., is enclosed for your inform. and you are requested to take necy. action, as suggested in para 2 and the concluding portion of the above cor. †p/s 131-133

By order of the G. of B.

Dy. Secy. to Govt.

Copy of †p/s 131-133 DA - ~~Se. O. No.~~ rcvd. to.

Copy forwarded for inform. to the El. Commr. with the G. of B. ~~the refee~~

~~ABB~~ 26-7-50.

Copy, with copy of the El. Commr's cor. No. T.C./11392, d. the 24-5-1950, also †p/s 131-133 forwarded to the S.E., D.I.C., for inform.

ABB. 26-7-50.

27/7 Calculations

Letter.

No.8340/36-E1(I), Public Works Department,
Bombay Castle (Bombay 1),
27th July 1950

To

The Executive Engineer,
Water Resources Investigation Division,
Poona.

Subject:- Kalinadi Hydro-Electric Project -
Hydrological observations in
connection with the -.

Reference: Your letter No.DB/B/15, dated the 26th April 1950.

2. A copy of the un-official reference No.TC/11392 dated the 24th May 1950, from the Electrical Commissioner with the Government of Bombay, is enclosed for your information and you are requested to take necessary action, as suggested in paragraph 2 and the concluding portion of the above un-official reference.

By order of the Governor of Bombay,

KJ 28/7/50

Deputy Secretary to the Government of Bombay,
Public Works Department.

D.A.-Copy of Un-official
Note referred to.

Copy, with copy of the Electrical Commissioner's un-official reference No.T.C./11392, dated the 24th May 1950, also forwarded to the Superintending Engineer, Deccan Irrigation Circle, for information.

VMW.
27/7/50.

Copy forwarded for information to the Electrical Commissioner with the Government of Bombay.

ISSUED
27/7/50

Finance Department.PWR.I.

Please see the note on the installations needed for the collection of Hydrological data for the Kalinadi Hydro-Electric Schemes at pages 79-111 ante. The Electrical Commr. has suggested that a sub-division be opened for organising the necessary hydrological observations. A statement showing various installations which would be required for the whole Kalinadi Basin is also attached. The cost of the observations for a period of 5 years is estimated at Rs.5,49,000. The details of the scheme will be found at pages 93-99 ante.

2. Attention in this connection is invited to Electrical Commr.'s letters dated 12.5.49 and 16/18-7-49. As the monsoon had already set in, the proposal was later on withdrawn by the El.Commr. That officer has now proposed to collect hydrological data in the whole of the Kalinadi Basin. There is no provision in the current year's budget for the Kalinadi Hydro-Electric Scheme Survey. A new item for 1950-51 put up in this respect was not accepted by Govt. to be any urgency about the work under consideration we may request the P.W.D. to put up the scheme as a new item for 1951-52 especially in view of the present financial stringency.

x vide 'A' on page 11 ante

18.9.50

18-9-50

19/9

x vide to the P.W.D. dt. 19.9.50

8340/36/77751.

P. W. Deptt.

El.Br.(I).

Submitted with refce. to the office note
c ted the 19-7-50.

2. The F.D. advises to put up the scheme as a new item for 1951-52 especially in view of the present financial stringency. It is presumed that the F.D. has agreed to the proposal to sanction the estimate amounting to Rs.5,49,000/- for hydrological observations in connection with Kalinadi Hydro-Elec. Scheme Project. The above estimate may be sanctioned ~~as after~~ and the El.Commr. may be asked to provide for this work as a new item in the year 1951-52 after U.O.R. to the F.D. for confirming the presumption made above.

Thro' I.E.(I), E.E(I), E.B.(II)
A.B.(III).

D.S.
secy.

V. Insert.

PWP 6
28-X-50.

To Fin Deptt (with PWD 8340/36-II)
Finance Department, PWR

Submitted with ref. to this Dept note dt. 19.9.50 at p-143 ante
2. The PWD presumption in ~~proposal~~ para 2 of its foregoing note may be confirmed.

3. The total estimated c p.135 of Rs.549,000 is on accou of works, establishment a

and tools and plant. Provision for special establishment and tools and plant is initially recorded under the head "52-A," and then transferred on pro-rata basis, to "81-A" by a corresponding reduction under "52-A." The P.W.D. may therefore be requested to propose the new items for special establishment and tools and plant, required for Elec. Grid Schemes, under "52-A" and for "works portion" under "81-A."

8.11.50.

D.S. (Secy.)

D.S. (Bonn)

I.R. to the P.W.D. dt. 13.11.50. (with P.W.D. file 8340/36-II)

El. Br (I)
17/11.

P. W. D.
File No. 8340/36 III
Serial No. 93870
E I B I
15-11-50

this Ncss (2 nos.
L.Dr. : 1 at
Wl :
17/11

2.07 OOD

147

Kalinadi Hydro-El.Project
Hydrological observations
in con. with -

Govt. of Bombay.

P.W.D.

Reso.No. 8340/36.

B.C.(Bombay No.1), ~~Oct.~~ Dec 1950.

P- 113/114 7

Letter No.47-3/3601,dated the 13-3-50,from the Elecl. ~~Engr.~~ Commr. with the Govt. of Bombay as under:-

(Enter.) M/113-114

Resolution:- The estimate amounting to Rs.5,49,000 for the work of hydrological observations in connection with the Kalinadi Hydro Elec.Scheme is approved administratively.

2. Provision for this work is proposed to be made as a new item of expenditure in the budget estimates for the year 1951-52. No expdre. on the work should therefore be incurred till the proposed provision is finally approved and communicated to th El.Commr.

By order etc.,

27/10/50

Dy. Secy. to the Govt.

To

The F.D.
The El.Commr. with the Govt. of Bombay.
The S.E., S.C.
The Collr. of Karwar..
The El. Engr. to Govt.
The A.G., Bombay.
The E.E. ~~Water Resources~~ ~~D.Dn.Poona~~ Nira R.B. Canal Dn.

1.
.0.50

Lg/Km
1/12

8340/56
93870

P.W.D.

Sec. Br (I)

Submitted.

2. It is proposed to accord administrative approval to the estimate amounting to Rs. 5,49,000 for the work of hydrological observations in connection with the Kalimadi Hydro Elec. Scheme. The note at pp. 135 to 137 ante explain the case. The R.C.D. and the F.D. have agreed to the proposal made by this Deptt. The F.D. has advised to put up the scheme as a new item for 1951-52. The draft at p. 147 ante may issue.

Asst A.B. (III)
21/11/50

Asst A.B. (III)

3. The necy. new item has been put up in file No. P-42/7. ⊗

21/11/50.

Under A.B. (III)

⊗ Slip II (submitted as a linked case)

D.S.

Secy.

H.M., P.W.D.

23/11

23/11/50

Hyd 11/50

23/11

Hyd 25-11-50

27/11

12 55

Re-submitted on 1-12-50 with file ... P 42/7/9414

1/-

The file was returned in A.B. (III) in connection with new item.

6/12/50

Kalinadi Hydro-Electric Projec
Hydrological observations in connection with -.

Government of Bombay,
Public Works Department.
Resolution No. 8340/36.
Bombay Castle (Bombay No. 1),
7th December 1950.

Letter No. 47-3/3601, dated the 13th March 1950, from the Electrical ~~Engineer~~ Commissioner with the Government of Bombay, as under :-

"Reference: This office letter No. H-7/3/11849, dated 16th/18th July 1949.

"As Government is already aware, the preliminary investigations on the Kalinadi scheme were carried out by Messrs. Associated Consulting Engineers (India), Bombay, and their report has been submitted to Government, vide this office letter No. Elg.120/3855, dated the 7th March 1949. Government had also approved of my proposal of taking up the detailed survey and exploratory work, leading up to and preparation of the project report for the Supa dam which is a part of the Kalinadi scheme, vide Government Letter, Public Works Department No.8340/36-El, dated 1st June 1949. Since this sanction of Government, it has, however, been indicated to me that the submission to Government of the detailed estimates for this investigational work may be held up till about June next. Obviously, no work on survey can be taken up till the estimates have been submitted to and approved by Government. Meanwhile, however, it is necessary to take immediate decision on the question of collection of hydrological data.

"2. For the correct design of such a hydro electric projec it is essential that hydrological data for a large number of years should be collected. It has, for example, been found on the Koyna investigations that last year's detailed monsoon dat was the most important for our investigations and without this data, our hydrological studies would not have been useful to any satisfactory degree. It is, therefore, essential that we should start collection of hydrological data in the whole of the Kalinadi basin from the coming monsoon and to continue the same till such time as the project is taken in hand or for at least a period of 5 to 10 years whichever is earlier. I have intentionally mentioned the whole Kalinadi basin because the full project consists of a number of ancillary projects inter-linked with each other and the collection of the data in the whole basin is an absolute necessity for correlation and proper study of any one of them.

"In this connection, I had suggested last year the undertaking of this work, but as the sanction was not received in time it was not possible to make a beginning, vide please my letter No. H-7-3/11849, dated the 16th/18th July 1949, to Government.

"3. It is now proposed to undertake this work and for this purpose, it is suggested that a subdivision be opened for organising the necessary hydrological observations; utility of various types of observations is mentioned in the enclosed note*. I also attach a*statement showing various installations which would be required for the whole Kalinadi basin.

*Printed as an accompaniment to this Resolution.

"4. The cost of these observations for a period of 5 years is estimated to be Rs.5,49,000/- as per the estimate attached. I request very early sanction of Government to this estimate so

that.....

that the necessary steps may be taken to appoint the staff to undertake the installation of the various gauges and start taking observations during the coming monsoon. To make this possible, it will also be necessary for Government to ensure the appointment of a full subdivision in time.

"As a lot of time would be needed for setting up of the organisation, fixing installations, etc., I shall be grateful for orders of Government in this behalf by the first week of the next month (April)."

RESOLUTION.- The estimate amounting to Rs.5,49,000 for the work of hydrological observations in connection with the Kalinadi Hydro Electric Scheme is approved administratively.

2. Provision for this work is proposed to be made as a new item of expenditure in the budget estimates for the year 1951-52. No expenditure on the work should therefore be incurred till the proposed provision is finally approved and communicated to the Electrical Commissioner.

By order of the Governor of Bombay,

(K. V. Joglekar)
Deputy Secretary to Government.

G.R. No.8340/36, P.W.D., dated 7th December 1950.

To

The Finance Department.
The Electrical Commissioner with the Government of Bombay.
The Superintending Engineer, Southern Circle.
The Collector of Karwar.
The Electrical Engineer to Government.
The Executive Engineer, Nira Right Bank Canal Division.
The Accountant General, Bombay.

Orders issued after consultation with Bhabha
Note [illegible] can be [illegible]

No. of 1950.

Copy forwarded for information and guidance to -

ISSUED 12/12

Accompaniment to Government Resolution, Public Works Department, No. 8340/36, dated the 7th December 1950.

A NOTE

ON THE INSTALLATIONS NEEDED FOR THE COLLECTION OF HYDROLOGICAL DATA FOR THE KALINADI HYDRO ELECTRIC SCHEME.

*****

The following are the installations needed for the collection of rain-fall and water discharge data :-

(a) Self recording Rain-Gauge:- This will be installed near an ordinary rain-gauge, so that the two can be compared.

The .....

The self-recording rain-gauges recently obtained from the Meteorological Department are not still functioning satisfactorily, and unless checked by an ordinary rain-gauge, the readings will not be reliable. Till we get more reliable self-recording rain-gauges, we have to use both kinds of rain-gauges for each rain-gauge station.

Be means of self-recording rain-gauges, it is proposed to obtain, three hourly, and six hourly correlation of rain-fall data, and work out probable rain pattern and obtain the peak discharges.

(b) Ordinary rain-gauges:- These will be installed in several places within the catchment area, so as to obtain an average rain-fall pattern in the catchment. After a few years of study of the correlation between the various rain-gauge stations amongst themselves and with the self-recording raingauges it may be possible to remove some of the ordinary rain-gauges, since from these studies, the rain pattern for the whole catchment area could afterwards be obtained by a few selected observations only.

(c) River Gauges:- These serve two purposes viz. correlating the river discharge to the gauge height, and secondly to correlate the time log between the rainfall in the catchment and the arrival of the flood at the gauge site.

(d) River Discharges:- These are very important data; required to calculate the total run-off as well as peak flood height at various sites. These are usually located at places which control the river discharge from the contributing scheme. All such sites will be fitted with river gauges.

The locations of the proposed installations in the various catchments for Kalinadi Scheme are given in the attached Statement I.

2. The sites will have to be inspected in detail before installation of the gauges and may have to be altered to suit local conditions.

3. It is proposed to oepn a temporary Kalinadi Sub-Division in April 1950, so that the Sub-Divisional Officer with headquarters at Supa, may supervise the erection of the gauges at various sites and later on look after the observations. He will analyse the readings and observations as may be obtained from day to day, from the next monsoon, in order to assess the correctness and correlation between the various observations.

An estimate based on the above proposals for the various installations as in Station No.II including the staff requirements for erection work for six months and observations for five years, is enclosed.

I

Statement of installations.

I. Supa Catchment:-

(1) Self recording and ordinary rain gauges -

(a) Chanduddi
(b) Castle rock
(c) Tinai Ghat Station
(d) Populwaddo.

(2) Ordinary rain gauges -

(a) Supa dam-site

(b) Aketidueagalli
(c) Londa
(d) Jugglepett
(e) Soliya
(f) Coonkeeray
(g) Kumbarwadi.

(3) River Gauges -

(a) Pandri river up-stream of its junction with Kalinadi.
(b) Kalinadi up-stream of its junction with Pandri river.

The above river gauges will be placed at such sites as are above the influence of the back water from the floods in the adjoining river.

(4) River discharge stations:-

(a) Supa dam-site.

II. Kaneri Catchment Area:-

(1) Self recording and ordinary gauges:-

(a) Coondol.

(2) Ordinary rain gauges:-

(a) Kalsye
(b) Dam-site near Gund.

(3) River discharge stations:-

(a) Dam-site near Gund.

III. Bomanhalli Pick up weir catchment

(1) Self recording and ordinary gauges:-

(a) Bomanhalli.

(2) Ordinary rain-gauges:-

(a) Pagoda.

(3) River discharge stations:-

(a) Bomanhalli.

IV. Lower Kalinadi Catchment:-

(1) Self recording and ordinary gauges:-

(a) Haliyal
(b) Dam-site.

(2) Ordinary rain-gauges:-

(a) Naglaye
(b) Kukenhatti
(c) Hulkop
(d) Junjanbail
(e) Inspection Bungalow near Khandrankop
(f) Junction of Kalinadi and Kaneri
(g) Chapoli.

(3) River Gauges:-

(a) Kaneri (above junction with Kalinadi)
(b) Kalinadi (above junction with Kaneri).

(4) River discharge stations:-

(a) Dam site
(b) Inspection Bungalow near Khandrankop.

The above sites have been marked in the drawing No. Misc. 80 of the Kalinadi Hydro-electric Scheme enclosed herewith.

KCJai
7-12-50

157 8340/36/93871

El.Bor.(I). P.W.D.

Submitted with reference to para 2 of p 152
G.R. No 8340/36, dt the 7-12-1950.

2/- Provision for this works proposed as a new item of expenditure in the budget estimate for the year 1951-52 has been omitted. No action is therefore necessary on these papers, at this stage.

Record. (Mno AB-II)

9/4/51
10

9/4/51

Letter:

No.E291/- 10549
Electric Grid Offices,
Mercantile Bank Building,
3rd floor, Fort,
Bombay 1. 16 April, 1961.

To

The Secretary to Government,
Public Works Department,
Bombay.

--

Sub:- Kalinadi Hydro Electric Project:
Hydrological Observations in connection with.

Ref:- G.R.P.W.D.No.8340/36 dated the 7th December,1950

For the installation of the various gauges etc. it would be necessary to create a sub-division as detailed in the sub-estimates attached to D.O. letter No.H.7-3/3601 of 13-3-1950 to Government. Sanction is, therefore requested to such a sub-division comprising the following:-

		Scale of Pay.
Assistant or Deputy Engineer.	1	220-15-400-20-500-E.B.25-650.
Junior Engineers.	17	80-5-100-8-140-E.B.10-220-E.B.10-270.
Senior Clerks	1	92-8-140.
Junior Clerks.	3	46-3-85-E.B.4-105.
Tracer.	1	46-3-85-E.B.4-105.
Computor.	1	46-3-85-E.B.4-105.
Peons (including Chowkidar)	4	30-½-35.

The above items are slightly different from the ones mentioned in the previous estimates, but being based on the latest experience on the Koyna hydrology, are considered necessary and may please be sanctioned.

2. It may be mentioned that the provision made in the estimate for the staff is for 5 months in the year which is considered to be the monsoon period during which such observations will be taken. During the fair season this staff will be utilised on survey and other work of adjoining schemes.

3. Expenditure on establishment and installations will be incurred only after intimation from Government regarding allotment of funds during the current year. It is, however, necessary to get the necessary sanction for the staff needed in advance so as

P.T.O.....

--so as to save time when sanction to proceed with the work is received; hence this reference and request for sanction of staff.

T. J. Mackenzie
14.4.51
Chief Engineer.

VVB/12/4/51.

17/4
W. D.
File No. 8340/36
Serial No. 33658

16\ 8340/36/33658

K-Br. P.W.D.

Please see letter p159 dated the 16-4-1951 from the Chief Engineer, Bibar Electrical. It will be seen therefrom that the C.E. has approached Govt. to create a sub-division comprising an additional staff for the installation of various gauges.

2/- In this connection, it may be stated that the works of hydrological observations in connection with the Kalinadi Hydro Electric Scheme has been approved administratively in G.R. No 8340/36, dated the 7-12-1950. But, the provision for this works, proposed as a new item of expenditure in the budget estimates for the year 1951-52, has been omitted due to financial stringency. In view of this the proposal of the C.E. may not be accepted & that officer may be informed as per draft p151-153 p16 put up for approval.

Thro' B & E Brs

4-5-51
3/5/51
4-5-51
DS.

For want of funds we have to lose another precious year, in which this valuable hydrological data could have been collected to correctly assess the true potentiality of the Kali River valley. But as it is, there is no

option but to negative the C.E.E.C proposal

24/4/57

6/5/51

9/5/57

Letter 163 8340/36/33658

P.W.D
BC (B'bay NO I)
11th May 1951

No. 8340/36-K.

To

The Chief Engineer, Bombay Elec. Grid.

Subject: Kalinadi Hydro Electric Project.
Hydrological Observations in connection with.

Reference: Your letter No E 291/10549, dt the 16-4-1951 p 159

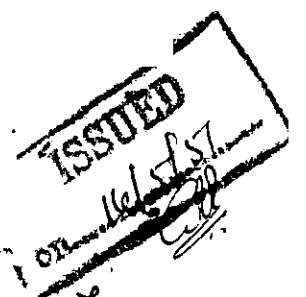
2/- Provision for the works of hydrological observations in connection with Kalinadi Hydro Electric Project, proposed as a new item of expenditure

in the budget estimates for the years 1951-52, has been omitted due to financial stringency. Your proposal to create a sub-division for the installation of the various gauges, cannot therefore, it is regretted, be accepted

DA :- nil

By order etc.;

Asstt Secy to Govt.



Shri Kuk (Pl speak)
15/6/51

Y Shroff
16/6/51

165 8340|36|33658

K-Br P.W.D.

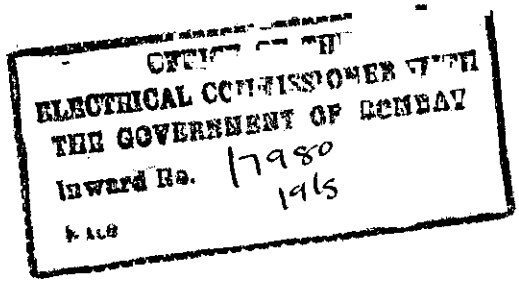
Resubmitted with reference to the O.N. p 161 of the 3-5-51.

2|- As the provision for the works of hydrological observations in connection with Kalinadi Hydro Elec. Project has been omitted in the year 1951-52, for want of funds, it is for orders whether the C.E., B'bay Elec. Grid may now be requested w.o. to propose this item as a new item of expenditure in the budget estimates for the year 1952-53.

17/5/51

yes
Kg 18/5/51.

U.C. to H.E., B.E.G., dd. 19th May 1915



167

Below Government P. W. D., U. O. R.
No.K-Br/8340/36/33658 dated 19-5-1951.

ELECTRIC GRID BOMBAY.

Seen and returned with compliments.

It will be included as a new item in my budget for 1952-53.

30.5.51

To
The Secretary-
to Government,
P. W. D.,
Bombay.

U.O.R.No.E-291/ 15393

Bombay, 30 May 1951.

VVB/29/5/51.

169

8340/36

47584

K-Br.

P.W.D

Submitted p167 with reference to the O.M. of this p165 17-5-51.

Await.

Thro 'B' Br

18/6/51 S/Gdl

kg 7/6/51

Letter. 171

No.H7-3/ 17328
Electric Grid Offices,
Mercantile Bank Building,Fo
Bombay.1: June,1951.
19

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject:-Kalinadi Hydro Electric Project
- River gauging operations for

Reference:-Govt.P. .D.letter No.8340/36-K
dated 11-5-51.

It is noted that the provision for a sub-division for hydrological observations in connection with Kalinadi Hydro Electric Project has been omitted from the budget 1951-52. Proposals will be submitted to Govt. in due course for its inclusion in 1952-53 budget.

As Government are aware, certain gauging operations duri during monsoon have been carried on at Gund causeway and Dandelli since 1948. The work consists of daily observations of gauge readings of the water level of Kalinadi River at Dandeli and that of the Kaneri River at Gund Causeway for the 4 monsoon months every year (vide para 3 of this office letter No.EIG-12/A/12507 dated 29.7.1949 re: the revised estimate for the Kalinadi Hydro Electric Project Preliminary Investigation). The continuity of these observations is considered essential as a break even for one season will seriously affect the usefulness of the previous and subsequent data. Such authentic hydrological data will be useful at the time of preparing designs and estimates for the concerned scheme.

I have, therefore, spoken to the Divisional Forest Officer, North Kanara, Karwar to issue instructions to continue these observations which his officers at Dandeli and Gund Causeway have been carrying out.

The estimated cost of this work is Rs.151/- for the monsoon period. It is proposed to treat it as Preliminary Investigation for Grid schemes and meet the expenditure from the budget provision of Rs.3000/- under this head.

~~G.H.A/1551~~
S 40'20

K. Br. P.W.D.

P171

Letter dated the 19-6-51 from the Chief Engineer, B.E.G. which is self-explanatory, is submitted with reference to the G.L. at p 163 ante.

2/- As the C.E. proposes to meet the cost amounting to Rs. 451/- in connection with the river gauging operations from the provision of Rs. 3,000/- in the current year for "Preliminary investigations for Elec. Grid schemes" under the head "81-A"; no specific action seems necessary on the part of Govt.

Thro' DE(P) & B'Br

DS 9/7/51

10/7/51

B. Br. Sl is seen & remain

10.7.51 Seen

11-7-51

New Secy

U/S 13.7.51

31.7.51

5-8-52
~~15-8-52~~
~~15-8-52~~
~~12-1-53~~

13/11/51

Audit (1-7-52)
31/5 Sept 19
561

175.

17130

No. A/67/Kalinadi/
Electric Grid Offices,
Mercantile Bank Building, Fort,
Bombay 1. 13th June, 1952.

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject:- Kalinadi Hydro Electric Project -
River-Gauging operations for the.

The River Gauging observations for this project were first started in the year 1948 at Dandeli on Kalinadi river and at Gund Causeway on Kaneri River. The continuity of the River Gauging observations in these rivers for the current monsoon season is considered essential as a break even for one season will seriously affeet the usefulness of the previous and subsequent data.

2. The Divisional Forest Officer, North Kanara, Dharwar, has already been instructed to continue these observations for the coming monsoon.

3. As there was no provision in the Budget grants for (1951-52) for K.H.E. Project, Government were informed, vide this office letter No. H7-3/17320 dated 19th June 1951 that the item of these observations will be treated as Preliminary Investigation for Grid Schemes, and the expenditure would be met from the Budget Provision sanctioned under this head.

4. Similarly as there is no provision for K.H.E.Project in the Budget grants for (1952-53), it is proposed to treat the item of observations as a Preliminary Investigation for Grid Schemes and meet the expenditure from the Budget Provisi of Rs. 3,000/- under this head sanctioned for 1952-53.

5. The estimated cost of this work is about Rs. 700/- for the ensuing monsoon period. A copy of the estimate is enclose herewith for reference.

6. Government approval to this may kindly be accorded.

13/6/52

Chief Engineer.

8340/36/55957

P.W.D.

K.Br.

The C.E., B.E.G may be asked to forward the copy of the estimate mentioned in para 5 of the letter P 175 under disposal as the same has not been received in this office along with the letter. The draft P 171 put up for approval may issue.

DS.
7/6/52
ASO
17/6/52

Sd/
18/6/52

AAS.

P. W. D.
8340/36
55957.

177 8340/36/55-957

Letter.

P.W.D.,
B.C, CB'bay No 11,
18th June 1952.

No. 8340/36/55-957-K.

To

The Chief Engineer, Bombay Electric Grid.

Subject:— Kalinadi Hydro Electric Project.
River-Gauging operations for the.

Reference:— Your Letter No. A/67/Kalinadi/17130, @ 175
dated the 13th June 1952.

2 The estimate referred to in para 5 X of the above mentioned letter has not been received

been received ~~along with it~~ in this office. The estimate should therefore be sent to ~~this office~~ Govt. at an early date. Further action in the matter will be taken thereafter.

By order etc.

D.A. Nil

(A. A. S.

e.m.
17/6/52

AAS
17/6/52

Name & board
18/6

179

Letter.

No.6340/36/55957 K.

Public Works Department,
Bombay Castle (Bombay No.1),
18th June 1952.

To

The Chief Engineer, Bombay Electric Grid.

Subject:- Kalinadi Hydro Electric Project -
River-Gauging operations for the.
.....1952

Reference:- Your letter No.A/67/Kalinadi/171, the 13th June 1952.

2. The estimate referred to in paragraph 5 of the above mentioned letter has not been received in this office. The estimate should therefore be sent to Government at an early date. Further action in the matter will be taken thereafter.

By order of the Governor of Bombay,

16/6/52

Assistant Secretary to the Government of Bombay,
Public Works Department.

D.A.-Nil.

2
AA/18/6/52.

TRUE COPY

Electric Grid Offices,
Bombay.

PUBLIC WORKS DEPARTMENT

Dated May 1952.

MAIN HEAD

MAJOR HEAD 31-A Capital Outlay on Electricity S

MINOR HEAD Preliminary Investigations for Electr
-chemes.

DETAILED HEAD

ESTIMATE framed by the Superintending Engineer (Civil),
of the probable expense
that will be incurred in connection with Hydrological
observations for Kalinadi Hydro Electric Project:-

Rs. 700/-

ABSTRACT

QUANTITY	ITEMS	RATE	PER	AMOUNT
1 7 months	One clerk for recording water levels at Supa causeway on Kanara River for for seven months. Commencing from 1st June 1952 to 31st December 1952.	95/-	P.M.	665/-
	Remuneration to the Depot Officer Dandeli for recording water levels on Kalinadi River at Dandeli for seven months Commencing from 1st June 1952 to 31st December 1952.	5/-	P.M.	35/-
				700/-

Rs. 700/- D.B. Anand
Superintending Engineer
(Civil)

25 183

No. A/67/Katiadi/ 19238
Electric Grid Offices,
Mercantile Bank Building, Fort,
Bombay-1, 31st July 1952.

To

The Secretary to Government,
Public Works Department,
Bombay.

Subject :- Kaliwadi Hydro Electric Projection River Gauging Operations for the -.

Reference:- Government Public Works Department letter No. 8340/36/50957/A dated the 16th June 1952. P179

With reference to the letter cited above I am to forward herewith a copy of the estimate which had remained back through oversight. P187

for Chief Engineer.

Encl : 1.

No. 8340/270-K

P.W.D.

B.C. Bombay No.

27th Oct. 195

To

The C.E., P.E.G.

Sub:- Kalinadi Hydro Elec Project:
River-Gauging operat for the-....

Ref:- your letters No. A/67/kalina 17130, dated the 13-6-52 and No. A/671 Kalinadi/19238, dated the 3-7-52;

2. your proposal to treat the item of the river-gauging observations in respect of the Kalinadi Hydro-Elec Project, during the current monsoon, as preliminary investigations and to meet the expenditure thereon amounting to Rs. 700/- from the Budget provision of Rs. 3000 for the current year under the Head "81-A Capital Outlay on Electy. Schemes - Preliminary Investigations for the ~~Electy~~ & Elec Grid Schemes", is approved.

By order etc

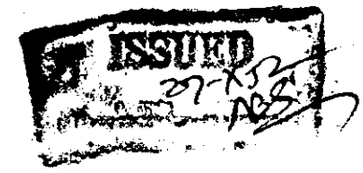
Dy. Secy. to Govt

D.A. Nil

Orders issued after consultation with Finance Department. Notes remain with this Department and to be seen when required.

Copy forwarded to the
the 3rd.
– the A&3rd.
the A.S. Bombay (thro the 3rd)
for information.

11/10/52



Amb-1 (A.1-51)
2-1/10